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By a resolution passed at the session of 1851, the Committee of Publication were instructed to print conspicuously, at the beginning of the volume of the *Transactions*, the following disclaimer :—

"The American Medical Association, although formally accepting and publishing the Reports of the various Standing Committees, holds itself wholly irresponsible for the opinions, theories, or criticisms therein contained, except when otherwise decided by special resolution."

CONTENTS.

MINUTES

OF THE

THIRTY-FIRST ANNUAL MEETING

OF THE

AMERICAN MEDICAL ASSOCIATION,

Held in New York City, June 1st, 2d, 3d, and 4th, 1880.

THE Association met in the Hall of the Young Men's Christian Association, corner of Twenty-third Street and Fourth Avenue, at 11 A. M.

The President, Dr. LEWIS A. SAYRE, of New York; the Vice-Presidents, Dr. R. BEVERLY COLE, of California; Dr. EZRA M. HUNT, of New Jersey; Dr. H. O. MARCY, of Massachusetts; and Dr. F. PEYRE PORCHER, of South Carolina; the Permanent Secretary, Dr. WILLIAM B. ATKINSON, of Pennsylvania; the Assistant Secretary, Dr. WALTER R. GILLETTE, of New York; the Treasurer, Dr. RICHARD J. DUNGLISON, of Pennsylvania; and the Librarian, Dr. WM. LEE, of District of Columbia, occupied their respective positions.

The Ex-Presidents were requested to take seats on the platform. In response to which invitation, Dr. SAMUEL D. GROSS, of Pennsylvania; Dr. WM. O. BALDWIN, of Alabama; Dr. JOSEPH M. TONER, of District of Columbia; Dr. J. MARION SIMS, of New York; Dr. HENRY I. BOWDITCH, of Massachusetts; and Dr. T. G. RICHARDSON, of Louisiana, presented themselves and were most cordially received.

Prayer was offered by Rev. W. F. MORGAN, D.D., of New York.

Dr. T. GAILLARD THOMAS, of New York, Chairman of the Committee of Arrangements, then welcomed the members of the Association to New York, as follows:—

Fellows of the American Medical Association:

The pleasing duty has fallen to my lot of bidding you welcome to New York, and of offering you the hospitality of our homes. Sixteen years have passed since your Association last honored us with a visit. Let us pause for a moment, and consider what those years have borne upon their wings!

The struggle which at that time convulsed our land, has given way to peace; the terrible mental sufferings, which ever mark fratricidal quarrels, have quieted down into restored affection; the devastating consequences of an exhausting titanic conflict have been replaced by prosperity; and unity, peace, and concord have made glad the blessed land which we proudly call our home! At the last meeting here, when all our horizon appeared so dark and foreboding, we welcomed you, Fellows of the Association, as our colleagues and our friends. Now that the happy issue has been reached—when the genial rays of the sun of national prosperity have made the whole landscape bright and effulgent—thrice warmly do we hail you as our brothers, inalienable, now and forever.

In this noble metropolis, whose doors are to-day thrown open to welcome you, you will see many wonderful changes, for sixteen years in the present day are equal to a cycle in the past. But in none of its advancing circles will you discover more evident signs of progress than in that department upon which your affections, your best wishes, and your highest ambitions are fixed.

As we whose homes are made amidst its busy walks show you, in the pleasant week which lies before us, its gorgeous edifices, its unsurpassed thoroughfares, and its magnificent works of art, we shall feel a sincere satisfaction in recognizing the fact that the pride excited by these falls into shadow and insignificance before that which is created by the demonstration to you that New York—the money-seeking, the utilitarian, and the superficial, as she is so often regarded—has learned to honor science, to appreciate its results, and to reward its struggles. It shall be our pleasure to exhibit to you, not the palaces in which her bankers conduct the finances of the world, nor those in which her merchant princes carry on a traffic which knows no limits but those of the inhabited earth. It shall be to show you how these men house and clothe and care for the poor, the sick, and the needy; to lead you until a pleasant fatigue overtakes you through miles of well-appointed hospital wards, whose hygienic appointments will put to the blush those of the stateliest palaces of European kings; to convince you, by incontestable evidence, how true, how loyal, and how sincere an appreciation of the science and art of medicine the representative city of America has acquired.

In the olden time men of wealth reared monuments to their memories by the erection of chapels and statues; of fountains,

of groves, and of public baths. It has become the custom of our own day to perpetuate their memories in the murmured gratitude of the sick, the thankful epithets of the poor and needy. The Holy Grail is no longer sought for in distant lands, but is found at the doorway through which we daily and hourly pass.

And to our calling belongs the proud privilege of furnishing a background to the gorgeous colors of such a noble picture, for every charitable institution rests upon a tripod; one foot, the gold of the wealthy benefactor; the second, the noble Christian faith, the mother of hospitals and charities; and the third, the science of medicine, the representative upon earth of a good God, the dispenser of health. "Homines deos accedunt dando salutem hominibus."

Let us, then, rejoice together that the day has passed when the glory of this great city rests upon the successful accumulation of her money changers; upon gold and tinsel. She should to-day be known as the city of noble charities, the home of healthy and vigorous science.

We are living in an age, the intellectual life of which contrasts most strikingly with that of any which has existed in the past. The difference is certainly not due to the greater intellectual power of the present. The men who lived in the days of Plato and Socrates; of Cicero and Virgil; of Bacon and Newton, surely had all the brain-force which has been evolved by any who have left their impress upon the nineteenth century. We must look for the difference elsewhere. The characteristic feature, the formative factor of our time is the continual, complete, and perfect intermingling of thought.

In the olden time a grand idea has its birth in the brain of a great Grecian. He springs from his bath, and, mad with enthusiasm, rushes half naked through the streets, with the cry of "Eureka, Eureka." But how is the world to obtain and appropriate this thought? A few thousand men collecting in groves and open spaces receive it from the mouth of a teacher; it is entombed in a musty manuscript, and there it dies; or, remaining alive, like seeds buried in the pyramid of Cheops, germinates ages afterwards.

A God-given thought, a grand conception, emanates from the mind of an obscure dentist in the nineteenth century. He has learned how to annihilate pain, and to render him unconscious whose living limbs are dissected by the surgeon's knife; and within half a year the uncouth physician who plods his way o'er the snow-bound steppes of Russia, or tends the convicts working in the mines of Siberia learns of the great discovery, and makes it subservient to his daily labors.

Imagine a pool of dark and stagnant waters, brightened everywhere by the rays of the sun, and here and there thrown into brisk and stirring eddies by the winds and other passing influences, and you have before you what may be likened to the

intellectual life of former times. The waters are deep and pure, and brilliant in their depths; the eddies which here and there occur are active and vigorous, and stirring in their circumscribed localities; but those of the centre and on the surface never mingle with those on the borders and in the depths; or mingle so slowly that the original impetus is lost, and "its pith and moment turned awry."

Imagine this same pool stirred from centre to circumference, so that the waters, rapidly radiating and circling, mingle in every part, no solitary drop being left in isolation and inaction, and you have the intellectual life of the nineteenth century.

And what, let us inquire, are the instrumentalities effecting this change, and which our forefathers did not possess? The printing-press, the railroad, and the telegraph! These, and these alone, are what have rendered our civilization superior to any which has preceded it. Annihilate these, rob our age of these vivifying influences, and the actively circulating waters of our intellectual pool would become as still and as sluggish as those of the past. Suppose our predecessors to have had these advantages, and who can doubt that with them they would have accomplished all that we have been enabled to perform?

And what glorious havoc have these influences made with the theories of the schools, the dogmas of the sects, and the dicta of the masters! A fact declared, or a position assumed, and thousands of wires flash, thousands of steamers plough the deep, and thousands of engines rush over their iron ways to lay it in judgment before a jury composed of the master minds of the civilized world! By this tribunal its right to existence is pronounced upon, and, thanks to its verdict, the humblest amongst us may to day, with perfect sincerity, declare himself, "nullius addictus in verba magistri jurare."

Another grand result which they have accomplished has been the general elevation of professional tone throughout the world. From this hall, tenanted as it is at this moment by the representative men of our profession in America, we may truthfully and joyfully declare to the young men about to enter it, that the shibboleth of success in medicine to-day is merit; honest, uncompromising, unalloyed merit! True it is that if by success is meant the acquisition of gold, the attainment of popular notoriety, the way of the transgressor is easy, and the methods of fraud are still potent; but to the true physician these things, obtained at the expense of professional honor, no more constitute success than hypocrisy and deceit constitute honesty! Time was, and not so long ago, when the powdered wig, the gold-headed cane, the portentous presence, and the sonorous voice, were passports to success and eminence in medicine. But those days are dead; killed by steam, electricity, and the printing-press. *Pax eiscum!* May their ashes never again take embodied form!

These being the main elements in the advancement of our times, as lesser ones have sprung from them a marked tendency to community of language, and the development of societies devoted to the interests of every profession, guild, and calling. No avocation in the world has, under the fostering influences mentioned, more rapidly developed than medicine. Emerging from the confined boundaries of a simple art, it has limited itself only by those of a noble science.

And what, Fellows of the American Medical Association, is the end and object which brings us together to-day; which has collected in this little hall in the city of New York the hundreds who have traversed thousands of miles of territory, from the forest regions of Maine, from the flowery lands of the Gulf, from the beautiful slopes of the Pacific, from the prairies of Nebraska and Minnesota, from the border-lands of Mexico, and the shores of the noble St. Lawrence? Like the waters of a gigantic lake have you come, rushing with the rapidity of steam, from the borders and the depths, and the estuaries and the shoals, to one common centre, to emit and to absorb thoughts, and to give one to another friendly greeting, and the handshake, and the kindly interchange of expression which passes only from eye to eye as you bid each other God speed in advancing the interests of that noble profession which most closely allies man to his Maker.

Our mission, then, is a noble one, for we are assembled together to take advantage of the surpassing opportunities of our century—to educate and, standing shoulder to shoulder, to encourage and sustain each other in the work which lies before us.

And now, a few words in a less genial strain. If these things be true, and no man will gainsay them, powerless fall the hand, and palsied be the tongue of him who, enrolled in the ranks of medicine, utters one derogatory word, or strikes one traitor blow at the life or usefulness of an institution whose function is so lofty and whose mission is so elevated. Is it inefficient or badly managed? Then let those who recognize this fact enter its widely open portals, and within its halls correct the existing evils. Has it become too much the field of medical politics? Then let the noble and the pure, the good and the brave in our ranks, come boldly forward, and with indignant heel crush the head of the creeping serpent; but let no man stay at home, deprecate evils, which, if they exist, the absence of himself and men like him have created, and fulminate anathemas against a noble institution which begs his aid to improve, to strengthen, and, if necessary, to reform.

The aspirations of man are full of vanity, but no vain thought is more excusable than that which gives to him the desire to live in the memory of those he leaves behind him after he himself has crossed the dark and silent river. In a few years from now every voice which to-day is heard in this hall will be

silent forever, every hand will be still, every body will be dust, or will have passed by a beautiful transmigration into tree, or plant, or animal, or man. Let us hope that the work which we shall accomplish in this convention may live after us, and, like a monument more glorious than the miracles which mark the resting places of Egypt's kings, will lead those who tread in our steps to say,—there met those who, like Ben Adhem, loved their fellow men, and strove earnestly in their cause.

My pleasing task is done. As I began so let me conclude, in the name of the united profession of New York, let me, with outstretched hand and glowing heart, bid you welcome, thrice welcome, to our home.

The Permanent Secretary then read the list of those registered, and on motion of Dr. J. M. Toner, of District of Columbia, they were accepted as members of the Association.

ALABAMA.

State Medical Society,	Wm. H. Anderson,
	Wm. O. Baldwin,
	J. M. Collier,
	Geo. A. Ketchum,
	Wm. A. Mitchell,
	F. Tipton.
Med. & Surg. Soc. of Montgomery,	R. F. Michel.
Permanent Members,	J. P. Furniss,
	J. S. Weatherly.

ARKANSAS.

State Medical Society,	Edward Cross,
	J. B. Cummings,
	E. T. Dale,
	E. R. Duval,
	J. A. Dibrell, Jr.,
	D. C. Ewing,
	R. G. Jennings,
	Jas. M. Keller,
	D. A. Linthicum,
	R. S. Wallis.

CALIFORNIA.

State Medical Society,	R. Beverly Cole,
	G. A. Shurtleff.

COLORADO.

State Medical Society,	CHAS. DENISON.

CONNECTICUT.

State Medical Society,	A. W. BARROWS, W. G. BROWNSON, C. M. CARLETON, D. A. CLEAVLAND, CHAS. JAMES FOX, RALPH S. GOODWIN, T. M. HILLS, LOWELL HOLBROOK, E. P. SWASEY, THEODORE G. WRIGHT.
Fairfield County Medical Society,	WM. C. BURKE, JR., G. L. PORTER, G. A. SHELTON, WM. C. WILE.
Hartford County Medical Society,	JAMES CAMPBELL, JR., G. PIERREPONT DAVIS, E. B. LYON, JULIAN N. PARKER, S. W. ROCKWELL, W. G. STEADMAN, M. STORRS, R. STRICKLAND, W. A. M. WAINWRIGHT.
Litchfield County Medical Society,	W. W. KNIGHT, W. S. MUNGER, W. WOODRUFF.
Middlesex County Medical Soc.,	RUFUS BAKER, J. H. GRANNESS, ELISHA B. NYE, S. W. TURNER.
New Haven County Medical Soc.,	WM. H. CARMALT, FRANK E. CASTLE, ASA HOPKINS CHURCHILL, B. F. HARRISON, S. G. HUBBARD.
New London County Medical Soc.,	E. C. KINNEY, ASHBEL WOODWARD.

Tolland County Medical Society,	G. H. Preston.
Waterbury Medical Association,	Alfred North.
Windham County Medical Soc.,	Edwin A. Hill, Rienzi Robinson.
Permanent Members,	Timothy H. Bishop, J. B. Kent, C. W. Page, Chas. H. Pinney, L. S. Wilcox.

DELAWARE.

State Medical Society,	R. G. Ellegood, R. J. McKay, Wm. Marshall, G. T. Maxwell.

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Medical Association of D. C.,	Thomas Antisell, C. V. Boarman, S. W. Bogan, Swan M. Burnett, Johnson Eliot, G. P. Fenwick, C. M. Ford, J. Wells Herbert. Wm. L. Hudson, Jos. Taber Johnson, C. H. A. Kleinschmidt, Wm. Lee, F. B. Loring, G. L. Magruder, W. F. Marmion, D. W. Prentiss.
Permanent Members,	Samuel C. Busey, Jas. E. Morgan, S. O. Ritchey, Joseph M. Toner, Ralph Walsh.

FLORIDA.

State Medical Society,	R. B. Burroughs, A. J. Wakefield.
Permanent Member,	G. W. Betton.

GEORGIA.

State Medical Society,	J. W. Bailey, Robert Battey, Henry F. Campbell, E. C. Goodrich, Chas. W. Hickman, T. M. McIntosh, John D. Martin, Thos. Raines, J. G. Thomas, A. G. Whitehead, W. F. Westmoreland.
Permanent Members,	R. H. Jenkins, A. S. Payne.

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Southern Illinois Medical Assoc.,	H. R. Guthrie.
Adams County Medical Society,	Wm. A. Byrd, F. M. Casal, J. H. Leslie.
Aurora Medical Society,	Abner Hard.
Brainard District Med. Society,	Jas. D. Whitley.
N. Central Illinois Med. Assoc.,	Jas. H. Braffet.
Central Illinois Medical Society,	W. J. Chenoweth.
Chicago Medical Society,	S. J. Jones, C. H. Lovewell.
Fox River Valley Med. Assoc,	E. F. Cleveland, Chas. N. Cooper.
Jersey County Medical Society,	A. K. Vanhorne.

Permanent Members,	GEO. H. CHAPMAN, W. S. LINN, JOHN MCLEAN, CHAS. GILMAN SMITH, H. WARDNER.

INDIANA.

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La Grange Co. Medical Society,	GEO. H. DAYTON.
Vanderburgh Co. Medical Society,	A. M. OWEN, WM. A. WHEELER.
Permanent Members,	JOS. EASTMAN, SILAS T. YOUNT.

IOWA.

State Medical Society,	A. M. CARPENTER, HENRY M. DEAN, BENJ. MCCLUER, H. H. MAYNARD,

State Medical Society,	H. B. RANSOM, A. B. REED, W. S. SCHERMERHORN, GEO. WARNE.
Clinton County Medical Society,	P. J. FARNSWORTH.
Keokuk Medical Society,	GEO. F. JENKINS.
Scott County Medical Society,	W. F. PECK.
Sioux City Medical Society,	R. C. RICE.
Warren County Medical Society,	W. M. PARK.
Permanent Members,	C. W. DAVIS, J. C. HUGHES, J. D. MCCLEARY.

KANSAS.

State Medical Society,	C. V. MOTTRAM, WM. SHEAN, D. W. STORMONT, W. S. TREMAINE.
South Kansas Medical Society,	JOHN D. HARTLEY.

KENTUCKY.

State Medical Society,	M. F. COOMES, J. A. OCTERLONY, DUDLEY S. REYNOLDS.
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S. Western Kentucky Med. Assoc.,	F. H. ENDERS.
Covington and Newport Med. Ass.,	C. F. THOMAS.
Louisville Academy of Medicine,	BENJ. J. BALDWIN.
Permanent Member,	T. B. GREENLY.

LOUISIANA.

State Medical Society,	JAS. S. FISK, T. G. RICHARDSON.

MAINE.

State Medical Society,	T. L. ESTABROOK, T. B. FERGUSON, A. J. FULLER, A. LEWIS GAUBERT,

State Medical Society,	F. GAUGER, N. A. HERSOM, F. E. HITCHCOCK, IRVING E. KIMBALL, S. LAUGHTON, WALLACE K. OAKES, CHARLES A. PACKARD, A. F. PAGE, ROTHEUS E. PAINE, E. F. SANGER, J. M. SMALL, B. F. STURGIS.
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Cecil County Medical Society,	JOHN H. JAMAR.
Clinical Society of Maryland,	WM. GREEN, J. T. SMITH, RANDOLPH WINSLOW.

Permanent Members, — Samuel Johnston, T. Clay Maddux.

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J. R. Bronson,
L. S. Brooks,
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Jas. Read Chadwick,
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M. L. Chamberlain,
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Howard F. Damon,
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Geo. Jewett,
W. H. Lathrop,
Sanford Lawton,
Walter H. Leighton,
Henry A. Martin,
S. C. Martin,
A. Mason,
E. E. Mather,
E. Mead,

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Worcester District Med. Society,	Rufus Woodward.
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Kalamazoo Dist. Med. and Surg. Society,	J. M. Snook.
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Wayne County Medical Society,	C. Henri Leonard.
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MISSOURI.

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St. Louis Medical Society,	Thos. E. Holland, C. H. Hughes, B. M. Hypes, E. W. Jamison, A. P. Lankford, Thos. F. Rumbold.
St. Joseph Surg. & Pathol. Soc.,	C. F. Knight.
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Strafford District Medical Society,	John S. Parker, P. A. Stackpole.
White Mountain Medical Society,	J. L. Patton.
Permanent Member,	Levi G. Hill.

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Burlington Co. Medical Society,	Franklin Gauntt, D. G. Van Mater.
Camden District Medical Society,	Onan B. Gross, N. B. Jennins.
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Essex County Medical Society,	W. J. Chandler, Abraham Coles, A. N. Dougherty, S. H. Pennington, D. W. Pierson, J. W. Pinkham, H. H. Tichenor.
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Hudson County Medical Society,	G. K. Dickinson.
Hunterdon Co. Medical Society,	Isaac S. Cramer.
Middlesex Co. Medical Society,	Henry R. Baldwin, Nicholas Williamson.
Monmouth County Med. Society,	J. E. Arrowsmith, D. McLean Forman.
Monroe County Medical Society,	J. M. Paul.
Morris County Medical Society,	C. Anderson, D. S. Ayres, A. E. Carpenter, J. G. Ryerson.
Passaic County Medical Society,	G. H. Balleray, J. R. Leal.
Sussex County Medical Society,	J. Miller.
Union County Medical Society,	J. A. Coles, Chas. A. Hart.
Warren County Medical Society,	S. S. Clark.
Permanent Members,	D. A. Currie, Wm. Elmer, D. C. English, Jas. S. Green, Ezra M. Hunt, John D. McGill, Chas. F. W. Myers, Alonzo Pettit, Isaac N. Quimby,

Permanent Members,
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D. W. Smith,
John D. Snowden,
Lott Southard,
Theo. R. Varick,
B. A. Watson.

NEW YORK.

State Medical Society,
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Henry B. Allen,
Wm. H Bailey,
John M. Bigelow,
Darwin Colvin,
H. S. Crandall,
Theo. Dimon,
E. D. Ferguson,
George Henry Fox,
C. C. F. Gay,
A. Gerster,
J. W. S. Gouley,
Wm. Govan,
C. R. Heaton,
H. C. Hendrick,
N. C. Husted,
Joseph C. Hutchison,
J. Foster Jenkins,
Jonathan Kneeland,
E. M. Lyon,
Nelson Nivison,
Edward H. Parker,
H. N. Porter,
D. B. St. John Roosa,
P. R. H. Sawyer,
B. F. Sherman,
Norman L. Snow.

Albany County Medical Society,
Jas. P. Boyd, Jr.,
W. Hailes, Jr.,
Jas. C. Hannon,
Henry March,
J. W. Moore,
John Ben. Stonehouse,
E. B. Tefft,
C. E. Whitbeck.

Cayuga County Medical Society,	B. A. Fordyce, Frank Kenyon, W. O. Luce.
Chautauqua County Medical Soc.,	E. Ames, A. B. Heard, J. Frank Pratt, Thos. D. Strong, T. C. Wilson.
Chemung County Medical Soc.,	P. H. Flood, Geo. H. Woodward.
Chenango County Medical Society,	Geo. Douglas, Henry C. Lyman, M. M. Wood.
Courtland County Medical Society,	Frederick Hyde.
Delaware County Medical Soc.,	John J. Buckley, H. A. Gates.
Dutchess County Medical Society,	D. Guernsey, A. B. Harvey, W. G. Stevenson, Lewis H. White, H. C. Wilber.
Erie County Medical Society,	A. R. Davidson, M. B. Folwell, Henry R. Hopkin, Herman Mynter, Wm. Ring, Wm. H. Slacer, Jas. P. White, C. C. Wyckoff.
Essex County Medical Society,	E. F. Edgerly.
Genesee County Medical Society,	A. G. Ellenwood.
Greene County Medical Society,	Wm. Stevens.
Herkimer County Medical Society,	Jas. M. Rose, John P. Sharer.
Kings County Medical Society,	J. S. Andrews, G. W. Baker, Isaac H. Barber, Homer L. Bartlett, D. G. Bodkin, E. S. Bunker, J. H. H. Burge,

Kings County Medical Society,	JOHN BYRNE, E. N. CHAPMAN, C. F. CLARK, GEO. R. FOWLER, WM. E. GRIFFITHS, J. S. HAWLEY, G. G. HOPKINS, J. H. HUNT, HERMAN KNAPP, J. B MATTISON, W. W. REESE, FRANK W. ROCKWELL, W. F. SANDFORD, S. SHERWELL, J. R. VANDERVEER, C. W. VROOMSON, WM. WALLACE, B. F. WESTBROOK, JARVIS S. WIGHT, F. W. WUNDERLICH.
Livingston County Medical Soc.,	B. T. KNEELAND.
Madison County Medical Society,	GILBERT BIRDSALL, HENRY FOORD.
Monroe County Medical Society,	J. O. ROE, JOHN WARD WHITBECK.
Montgomery County Medical Soc.,	THOMPSON BURTON, JOHN PARR.
New York Academy of Medicine,	JOHN G. ADAMS, JAS. H. ANDERSON, FORDYCE BARKER, C. E. BILLINGTON, F. A. BURRALL, ELLSWORTH ELIOT, E. T. ELY, HORACE P. FARNHAM, AUSTIN FLINT, JOEL FOSTER, V. P. GIBNEY, HORACE T. HANKS, SAMUEL T. HUBBARD, ABRAHAM JACOBI,

New York Academy of Medicine,

E. H. Janes,
Edward G. Janeway,
Chas. A. Leale,
J. R. Leaming,
F. N. Otis,
C. W. Packard,
J. C. Peters,
Alfred C. Post,
Samuel S. Purple,
Gouverneur M. Smith,
A. A. Smith,
Isaac E. Taylor,
T. Gaillard Thomas,
Edwin F. Ward,
F. V. White,
Wm. T. White,
Jas. R. Wood,
Leroy M. Yale.

New York County Medical Soc.,

Cornelius R. Agnew,
L. Bolton Bangs,
R. A. Barry,
Erskine S. Bates,
Mark Blumenthal,
Frank H. Bosworth,
Edw. Bennett Bronson,
John D. Bryant,
C. S. Bull,
W. E. Bullard,
Thos. Herring Burchard,
Salvatore Caro,
Juan Cisneros,
Clement Cleveland,
W. B. DeGarmo,
Geo. B. Fowler,
Robert M. Fuller,
Emil Gruening,
Alexander Haddon,
Frank H. Hamilton,
E. C. Harwood,
Mary Putnam Jacobi,
Joseph Janvrin,

New York County Medical Soc.,	A. B. JUDSON, W. H. KATZENBACH, DANIEL LEWIS, A. LIAUTARD, WM. M. MCLAURY, ERSKINE MASON, JOS. A. MONELL, HENRY S. OPPENHEIMER, HENRY G. PIFFARD, A. E. M. PURDY, F. LEROY SATTERLEE, T. E. SATTERTHWAITE, WARREN SCHOONOVER, SAMUEL SEXTON, JOHN SHRADY, HENRY M. SILVER, J. LEWIS SMITH, FRED. R. STURGIS, EDW. WAITZFELDER, DAVID WEBSTER.
New York Med. and Surg. Soc.,	WM. M. POLK.
New York Medico-Chirurg. Soc.,	R. F. WEIR.
Niagara County Medical Society,	CHARLES N. PALMER.
Oneida County Medical Society,	SMITH BAKER, J. K. CHAMBERLAYNE, H. G. DUBOIS, EDWIN EVANS, W. R. GRISWOLD, EDWIN HUTCHINSON, H. C. PALMER, WM. RUSSELL, L. A. TOURTELLOT, J. E. WEST.
Onondaga County Medical Soc.,	J. W. BROWN, W. H. BROWN, GEO. W. COOK, A. J. DALLAS, GREGORY DOYLE, HARRY GIFFORD, JR., WM. T. PLANT, H. B. PRITCHARD.

Ontario County Medical Society,	J. T. SMITH.
Orange County Medical Society,	W. B. BRADNER, C. P. SMITH.
Oswego County Medical Society,	CHAS. R. LEE, DANIEL PARDEE, WM. H. RICE.
Queens County Medical Society,	P. G. FREYE, JAS. D. TRASK, D. B. WHITNEY, FRED. A. WRIGHT.
Rensselaer County Medical Soc.,	WM. S. COOPER, J. C. HUTCHINSON, LEROY MCLEAN, FRANCIS D. PARMELEE.
Richmond Co. Medical Society,	A. H. CARROLL, F. U. JOHNSTON.
Rockland Co. Medical Society,	JACOB S. WIGTON.
St. Lawrence Co. Medical Society,	Z. B. BRIDGES, JOS. E. COLBURN, JESSE REYNOLDS, A. N. THOMPSON.
Saratoga Co. Medical Society,	R. C. MCEWEN, BENJ. W. NOXON.
Schenectady Co. Medical Society,	PAUL ROCHE.
Schoharie Co. Medical Society,	H. F. KINGSLEY.
Schuyler County Medical Society,	J. H. GLASS.
Seneca County Medical Society,	E. J. SCHOONMAKER.
Suffolk County Medical Society,	EBENEZER P. JARVIS, WM. S. PRESTON.
Sullivan County Medical Society,	G. H. LATHROP,
Tioga County Medical Society,	W. L. AYER, GEO. P. CADY, ROBT. W. EASTMAN, C. L. STILES.
Tompkins County Medical Soc.,	G. WILDER.
Westchester County Med. Soc.,	A. M. CAMPBELL, HORACE CARUTHERS, J. F. CHAPMAN, GEO. W. HODGSON, HENRY L. HORTON, JOHN PARSONS, H. ERNEST SCHMID.

Permanent Members,

S. G. Armor,
C. O. Baker,
Jas. L. Banks,
Geo. M. Beard,
A. Nelson Bell,
G. H. Bennett,
H. F. Bennett,
Wm. N. Blakeman,
R. B. Bontecou,
E. W. Bottum,
Nathan Bozeman,
L. Duncan Bulkley,
D. R. Burrell,
Mathew H. Burton,
G. T. Campbell,
Wm. Chase,
Thos. F. Cock,
J. Cronyn,
S. G. Dearborn,
Henry D. Didama,
G. W. Earle,
Jas. Ferguson,
C. S. D. Fessenden,
Geo. Jackson Fisher,
Thos. M. Flandrau,
N. H. Freeland,
M. M. Freeman,
J. P. Garrish,
D. H. Goodwillie,
J. P. Gray,
Elisha Harris,
Everett Herrick
Abbott Hodgman,
Wm. Frederic Holcombe,
B. L. Hovey,
Jas. B. Hunter,
H. M. Ives,
Ferris Jacobs,
Chas. R. Lee,
Jas. L. Little,
E. S. Lyman,

Permanent Members,

R. R. McIlvaine,
S. B. W. McLeod,
E. M. Moore,
Paul F. Munde,
W. W. Munson,
Robert Newman,
Chas. H. Nichols,
H. D. Noyes,
E. C. W. O'Brien,
R. J. O'Sullivan,
Montrose A. Pallen,
Henry Pamphilon,
Per Lee Pine,
W. W. Porter,
W. W. Potter,
H. A. Record,
R. C. Reynolds,
Wm. H. Robb,
Lewis A. Sayre,
Edw. Seguin,
E. H. M. Sell,
J. Marion Sims,
C. O. Slocum,
J. O. Slocum,
S. Hanbury Smith,
Alex. W. Stein,
Jas. R. Taylor,
A. G. Thompson,
Wm. F. Thoms,
F. D. Vanderhoof,
Albert Vanderveer,
Faneuil D. Weisse,
John F. Whitbeck,
W. H. Williams,
Samuel G. Wolcott,
C. S. Wood,
W. Gill Wylie.

NORTH CAROLINA.

State Medical Society,

N. J. Pittman,
L. L. Staten,
Thos. F. Wood.

Permanent Member,	WM. GLEITSMAN.

OHIO.

State Medical Society,	H. H. AYRES, W. M. BEACH, JOHN BENNITT, W. J. CONKLIN, J. W. CRAIG, W. W. DAWSON, J. W. HAMILTON, H. J. HERRICK, A. V. PATTERSON, J. C. REEVE, XENOPHON C. SCOTT.
Champaign County Med. Society,	PORTON R. BENNETT, JR., W. S. HUNT, S. M. MOSGROVE.
Cincinnati Academy of Medicine,	JULIA W. CARPENTER, A. E. HEIGHWAY.
Union Medical Soc. of Columbia and adjoining Counties,	JOHN L. FIRESTONE, WM. MOORE, W. C. PEARCE.
Delaware County Medical Soc.,	S. C. DUMM.
Delamater Medical Association,	A. N. READ.
Fulton County Medical Society,	J. M. BATES, S. P. BISHOP.
Knox County Medical Society,	E. J. WILSON.
Logan County Medical Society,	N. V. SPEECE, M. D. WILSON.
Mahoning Co. Medical Society,	J. E. WOODBRIDGE.
Montgomery County Medical Soc.,	A. BOONE, E. C. CRUMM, THOS. L. NEAL,
Northeastern Ohio Medical Assoc.,	S. A. CONKLIN, N. S. EVERHARD, SALMON HUDSON, T. J. REED, A. W. RIDENOUR, A. M. SHERMAN, W. J. UNDERWOOD.

Trumbull County Medical Soc.,	Thos. H. Stewart.
Zanesville Academy of Medicine,	H. Culbertson.
Permanent Members,	Wm. Bunce, E. B. Harrison, Jos. D. Robison, J. H. Townsend.

OREGON.

State Medical Society,	H. R. Holmes.

PENNSYLVANIA.

State Medical Society,	R. B. Brown, J. E. Bulkeley, J. T. Carpenter, Rowan Clarke, Samuel D. Gross, Louis DeB. Kuhn, Benjamin Lee, Nesbit McDonald, A. M. Miller, Isaac Pursell, S. R. Rutledge, J. M. Shearer, J. H. Stubbs, James Tyson, E. A. Wood.
Allegheny County Medical Soc.,	Silas N. Benham, Wm. H. Daly, W. S. Foster, C. B. King, J. A. Lippincott, Jas. McCann, D. N. Rankin, Jos. A. Reed, Elliot S. Riggs, John Semple, J. D. Thomas.
Berks County Medical Society,	Geo. R. Kuhn, Jas. Y. Shearer.

Blair County Medical Society,	D. W. Bonebreak, W. M. Findley, W. C. Roller, G. W. Smith.
Chester County Medical Society,	W. R. Perdue, C. Galen Treichler.
Columbia County Medical Society,	J. H. Vastine.
Crawford County Medical Society,	J. Dana Littlefield.
Cumberland Co. Medical Society,	A. J. Herman, S. B. Kieffer, R. N. Short.
Dauphin County Medical Society,	E. H. Coover, Geo. D. Stahley.
Delaware County Medical Soc.,	Wm. B. Ulrich.
Erie County Medical Society,	M. Pickett, G. Thickstun.
Franklin County Medical Society,	Chas. H. Merklein, John Montgomery, Robert W. Ramsey, David F. Unger.
Indiana County Medical Society,	J. W. Hughes.
Lackawanna County Med. Soc.,	Horace Ladd.
Lancaster County Medical Society,	F. G. Albright, G. W. Berntheisel, Henry Carpenter, M. L. Herr, J. Henry Musser, A. G. B. Parke, J. L. Ziegler.
Lehigh County Medical Society,	Wm. B. Erdman.
Luzerne County Medical Soc.,	Harry Hakes, O. F. Harvey, W. G. Weaver.
Lycoming County Medical Soc.,	Thos. H. Helsby.
Montgomery County Medical Soc.,	J. O. Knipe, Geo. M. Stiles.
Montour County Medical Society,	J. D. Mausteller.
Northampton County Medical Soc.,	Jos. P. Engleman, Joseph Mixsell, Amos Seip.

Philadelphia County Med. Soc.,	HARRISON ALLEN, H. F. BAXTER, JOHN H. BRINTON, EDW. T. BRUEN, L. S. CLARK, R. A. CLEEMANN, ROLAND G. CURTIN, C. W. DULLES, M. S. FRENCH, W. GOODELL, SAMUEL W. GROSS, N. L. HATFIELD, F. P. HENRY, W. S. JANNEY, RICHARD J. LEVIS, CHAS. K. MILLS, S. WEIR MITCHELL, C. B. NANCREDE, H. W. NEWCOMET, WM. PEPPER, JOHN B. ROBERTS, CARL SEILER, E. O. SHAKESPEARE, LAURENCE TURNBULL, DE FOREST WILLARD, D. F. WOODS.
Schuylkill County Medical Soc.,	J. C. BIDDLE, G. W. BROWN, F. D. EMACK, S. S. KOSER, J. C. SPAULDING.
Susquehanna Co. Medical Soc.,	A. T. BRUNDAGE.
Venango County Medical Society,	S. H. BENTON.
Washington County Medical Soc.,	O. L. BLATCHLY, M. P. MORRISON.
Westmoreland Co. Medical Soc.,	J. W. ANAWALT, R. MCCONAUGHY.
York County Medical Society,	A. R. BLAIR, J. C. GABLE, JAS. W. KERR.

Permanent Members,

D. Hayes Agnew,
William B. Atkinson,
W. J. Asdale,
John L. Atlee,
Wm. R. D. Blackwood,
D. W. Bland,
P. B. Breinig,
J. Solis Cohen,
A. F. Coope,
Thos. M. Drysdale,
Louis A. Duhring,
R. J. Dunglison,
J. Aug. Ehler,
T. J. Gallaher,
H. Earnest Goodman,
Traill Green,
A. H. Halberstadt,
Thos Hay,
Addinell Hewson,
Geo. F. Horton,
Charles T. Hunter,
H. Isaac Jones,
W. W. Keen,
Peter D. Keyser,
W. F. Knox,
M. F. Longstreth,
T. Mabon,
C. M. Matson,
John R. McClurg,
J. Ewing Mears,
Oliver L. Miller,
Thos. G. Morton,
Michael O'Hara,
John H. Packard,
Wm. H. Pancoast,
G. G. Rahauser,
Samuel D. Risley,
J. A. Ritchey,
G. M Shilleto,
John V. Shoemaker,
E. N. Smith,

Permanent Members,	HENRY H. SMITH, WM. S. STEWART, WM. T. TAYLOR, CHAS. H. THOMAS, WM. VARIAN, J. K. WEAVER, WM. M. WELCH, FRANK WOODBURY.

RHODE ISLAND.

State Medical Society,	EDWARD STYLES ALLEN, GEO. P. BAKER, ARIEL BALLOU, A. G. BROWNING, OTIS BULLOCK, EDW. T. CASWELL, J. W. C. ELY, MOSES FIFIELD, C. T. GARDNER, JOB KENYON, CHARLES H. LEONARD, S. OSCAR MYERS, T. NEWELL, CHAS. O'LEARY, WM. H. TRAVER.
Providence Medical Association,	WM. J. BURGE, GEO. W. CARR, EDWARD M. HARRIS, ROBERT F. NOYES, GEO. W. PORTER, A. O. ROBBINS, ANITA E. TYNG.
Permanent Member,	CHARLES H. FISHER.

SOUTH CAROLINA.

State Medical Society,	S. BARUCH, WM. H. GEDDINGS, R. A. KINLOCH, F. PEYRE PORCHER.
Aiken County Medical Society,	P. G. ROCKWELL.

TENNESSEE.

State Medical Society,	MARX T. DAVIS, W. T. HOPE, VAN S. LINDSLEY, THOS. MENEES, W. J. MILLER, G. B. THORNTON.
Davidson County Medical Society,	WM. T. BRIGGS, RICHARD CHEATHAM, JOHN A. DRAUGHON, W. F. GLENN.
Nashville Medical Association,	DUNCAN EVE, T. O. SUMMERS, JR.

TEXAS.

State Medical Society,	GEO. W. CHRISTIAN, GREENSVILLE DOWELL, HENRY K. LEAKE, JOHN H. POPE, D. R. WALLACE, JOS. S. WILLIS.
Grayson Co. Medical Society,	L. A. GRIZZARD.
North Texas District Med. Assoc.,	E. W. RUSH.

VERMONT.

State Medical Society,	LEROY M. BINGHAM, C. M. CHANDLER, GEO. S. DAVENPORT, O. F. FASSETT, HENRY D. HOLTON, HENRY JANES.
Connecticut River Valley Medical Association,	E. R. CAMPBELL.
Rutland Co. Med. and Surg. Soc.,	C. W. PECK, THOMAS E. WAKEFIELD.
Permanent Members,	CHAS. L. ALLEN, A. T. WOODWARD.

VIRGINIA.

State Medical Society,	F. D. Cunningham, W. D. Hooper, Geo. Ben Johnston, Geo. Ross, Thomas B. Ward.
Albemarle County Med. Soc.,	J. Edgar Chancellor.
Norfolk Medical Society,	Herbert M. Nash.
Richmond Academy of Medicine,	A. S. George, Jas. B. McCaw.
Permanent Members,	J. L. Cabell, Hunter McGuire.

WEST VIRGINIA.

State Medical Society,	M. Campbell, John Frissell, J. P. Miller, J. W. Ramsay, W. F. Vankirk.
Med. Soc. of City of Wheeling and Ohio County,	T. O. Edwards, Jas. E. Reeves.
Permanent Members,	Sample Ford, L. C. Hunt, J. M. Lazzell.

WISCONSIN.

State Medical Society,	J. K. Bartlett, Samuel Bell, G. E. Catlin, J. N. De Hart, G. H. Fox, A. R. Freeman, G. W. Jenkins, Walter Kempster, Thos. P. Russell, O. W. Wight.

UNITED STATES ARMY.

Medical Department,	C. H. Alden, John S. Billings, J. B. Brown.

UNITED STATES NAVY.

Medical Department,	DELAVAN BLOODGOOD, S. F. COUES, J. R. TRYON.
Permanent Member,	ALBERT L. GIHON.

Protests against the reception of certain delegates were presented, and referred to the Judicial Council.

Vice-President Dr. R. BEVERLY COLE, of California, having taken the chair, the President, Dr. LOUIS A. SAYRE, then delivered the Annual Address.

On motion of Dr. WM. BRODIE, of Michigan, a vote of thanks was tendered to the President for his able address, a copy requested for publication, and its recommendations were referred to a committee of five with instructions to report at this meeting.

On motion of Dr. M. A. PALLEN, of New York, a temporary Section for Diseases of Children was added to the Sections for this year.

Dr. PALLEN, on behalf of the Committee of Arrangements, presented the following as Members by Invitation, and on motion they were elected.

MEMBERS BY INVITATION.—JOHN L. CAMPBELL, J. C. THOMAS, CHARLES HEITZMAN, S. A. RABORG, A. S. CHURCH, CHAS. BLISS, Y. W. STROMACH, GEO. G. WHEELOCK, of New York; G. B. BAYLES, Orange, N. J.; DAVID MAGIE, F. LANGE, J. C. JAY, F. E. HYDE, G. LANGMAN, WM. H. CHAMBERLAIN, S. H. DESSAU, C. A. KINCH, A. M. JACOBUS, J. H. FRUITNIGHT, P. C. COLE, JOHN H. NESBITT, WM. J. FIELDS, RICHARD T. BANGS, A. W. MAYNARD, of New York; GEO. W. WELLS, Brooklyn; J. BAXTER UPHAM, Boston; ROBERT W. TAYLOR, HENRY F. WALKER, LOUIS H. SAYRE, J. WILLISTON WRIGHT, W. C. GILLIAM, A. MCLANE HAMILTON, H. GOLDWAITE, C. A. VON RAMDOHR, H. F. NORRIS, C. S. WARD, B. MCE. EMMET, H. D. NICHOL, E. D. LORING, R. A. WITTHAUS, A. E. MACDONALD, B. F. DAWSON, F. A. CASTLE, A. H. BUCK, WM. H. HALL, C. C LEE, D. PHILLIPS, C. J. SHARRETTS, R. W. TAYLOR, F. H. BOSWORTH, M. CLYMER, and C. WAGNER, of New York; J. S. COLEMAN, Augusta, Ga.; D. D. BRAMBLE, Cincinnati; J. B. A. RISK, Covington, Ky.; W. W. WELCH, Norfolk, Connecticut; J. W. WELCH, West Winston, Connecticut; W. H. WELCH and L. F. PITKIN, of New York; H. L. SIMS, San Francisco; J. MACKENZIE GORDON, Australia; J. W. ROSEBRUGH, Hamilton, Canada; A. H. DAVID, Montreal, Canada; M. L. DIXON, Montreal, Canada; J. L. AXTELLE, Mr

JOSEPH HUTCHINSON, Liverpool, England; JOS. TRENHOLME, Montreal, Canada; T. H. NOTT, Texas; W. H. NASH, New York; JOHN H. JANEWAY, U. S. A.; W. H. HINGSTON, Montreal, Canada; DAVID CLARK, Toronto, Canada; I. MCFADIN CAMPENOS, Gaston, Brazil; W. R. BIRDSALL, New York; C. D. ALTON, Hartford, Connecticut; J. SOLON BRIGGS, Newark, New Jersey; Mrs. J. S. BRIGGS, Newark, New Jersey; E. COGGSWELL, Cambridge, Massachusetts; TALBOT JONES, St. Paul, Minnesota; Mr. JONATHAN HUTCHINSON, London, England; G. S. RYERSON, Toronto, Canada; G. A. COBURN, Cambridge, Massachusetts; T. A. MCPARLIN, U. S. N.; F. S. DENNIS, New York; T. MITCHELL PRUDDEN, New York; G. E. SUSSDORF, New York; D. W. MINER, Ware, Massachusetts; C. I. PARDEE, S. KOHN, J. H. HILLYER, New York; C. B. WHITE, U. S. A.; J. D. NELSON, Stonington, Connecticut; THOS. GOODWILLIE, Vernon, Vermont; LEWIS FISHER, New York; GEO. B. FERGUSON, Deer Isle, Maine; D. H. SHIELDS, Hannibal, Missouri; W. J. LUMSDEN, Elizabeth City, North Carolina; W. B. CHASE, Brooklyn, New York; WM. STEVENS, Cairo, New York; A. NELLIS, Jr., Montgomery Co., New York.

Dr. SAMUEL D. GROSS, of Pennsylvania, after a touching allusion to the recent affliction experienced by the President, L. A. SAYRE, moved that the Association tender to him, and through him to the family, their warmest sympathy in this sad bereavement by the death of Dr. CHAS. H. H. SAYRE. The motion was adopted by a rising vote.

Dr. EDWARD SEGUIN, of New York, presented from the Executive Committee on the Metric System a report, which was read by the Permanent Secretary.

On motion of Dr. WM. BRODIE, the Committee of Arrangements were instructed to have the report printed for the members in the morning.

On motion of Dr. J. M. TONER, the order of business was suspended, and notes from absentees were read, as follows:—

NEW ORLEANS, May 27, 1880.

Dr. W. B. ATKINSON,
Secretary American Medical Association.

DEAR SIR: It is with great regret that I find myself forced to inform the Association through you that the state of my health will prevent me from officiating as one of its chairmen at the meeting to take place in June next.

Very respectfully,
B. A. POPE.

On motion, the note was ordered to be entered upon the minutes.

The Permanent Secretary also announced that Dr. ALBERT H. SMITH, of Pennsylvania, Chairman of the Section on Obstetrics, had been compelled to go to Europe after a severe attack of typhoid fever.

Dr. AUSTIN FLINT, of New York, Chairman of the Committee on Prize Essays, presented the following report:—

The Committee on Prize Essays have the honor to report that one essay only was received. This essay the several members of the committee have examined with care. It embodies the result of laborious and extensive research in medical literature, and, in this point of view, has much merit. The committee, however, do not feel warranted in recommending it for a prize, for the reason that it fails to meet what, in their opinion, should be considered as a requirement, namely, originality of investigations which enlarge the boundaries of our knowledge.

AUSTIN FLINT,
ALFRED C. POST,
JOHN W. S. GOULEY,
J. C. HUTCHISON,
MONTROSE A. PALLEN,
Committee.

JUNE 1, 1880.

On motion, the report was adopted.

The report of the delegates to the Canadian Medical Association was offered and made the order for Wednesday morning.

On motion, the Committee of Arrangements was requested to make the announcement in each Section, that each State delegation was expected to report its member of the Committee on Nominations to the Permanent Secretary on the morning of Wednesday, at the opening of the general session.

On motion, adjourned to meet at 10 A. M. on Wednesday.

SECOND DAY.

WEDNESDAY, June 2.

The Association was called to order by the President at 10 A.M.

On motion of Dr. SAMUEL D. GROSS it was unanimously

Resolved, That the following gentlemen from abroad, members of this Association by invitation, be, and are hereby made honorary members of this Association:—

Dr. JONATHAN HUTCHINSON, of London, England; Drs. HINGSTON, HOWARD, DAVID, OSTLER, and TRENHOLME, of Montreal;

Dr. CLARK, of Toronto; Dr. JOHN A STEVENSON, of London, Ontario, Canada; Dr. ROSEBRUGH, of Hamilton, Canada; Dr. DILLON, of Dublin; Dr. DRYSDALE, of London; Dr. EMILIO L. DE MOLA, of Lima, Peru; Prof. G. B. ERCOLANI, of Bologna, Italy.

The Permanent Secretary called the roll of States, and the following was announced as constituting the Committee on Nominations —

Alabama, WM. O. BALDWIN; Arkansas, E. R. DUVAL; California, G. A. SHURTLEFF; Colorado, CHARLES DENISON; Connecticut, M. STORRS; Delaware, WM. MARSHALL; District of Columbia, JOHNSON ELIOT; Florida, A. J. WAKEFIELD; Georgia, J. G. THOMAS; Illinois, G. W. NESBIT; Indiana, MARSHALL SEXTON; Iowa, H. B. RANSOM; Kentucky, J. A. OCTERLONY; Kansas, W. S. TREMAINE; Louisiana, T. G. RICHARDSON; Missouri, P. G. ROBINSON; Michigan, J. B. BOOK; Minnesota, C. POWELL ADAMS; Maryland, JUDSON GILMAN; Maine, W. R. OAKS; Mississippi, R. E. HOWARD; Massachusetts, JOSEPH H. WARREN; New York, E. M. MOORE; New Jersey, H. A. HOPPER; North Carolina, J. L. STATEN; New Hampshire, G. P. CONN; Ohio, A. E. HEIGHWAY; Oregon, H. R. HOLMES; Pennsylvania, S. D. GROSS; Rhode Island, ARIEL BALLOU; South Carolina, S. BARUCH; Tennessee, DUNCAN EVE; Texas, J. H. POPE; Vermont, A. J. WOODWARD; Virginia, F. D. CUNNINGHAM; West Virginia, M. CAMPBELL; Wisconsin, WALTER KEMPSTER; United States Army, J. S. BILLINGS; United States Navy, J. R. TRYON.

Dr. ALBERT L. GIHON, of the Medical Department United States Navy, brought up the question of the non-registration of their delegates.

After much discussion, Dr. F. PRATT, of Michigan, a member of the Judicial Council, having declared that no authenticated charges had been presented to that body, on motion of Dr. S. D. GROSS it was agreed that they should be admitted until such charges should be authenticated.

The Permanent Secretary read a report from the Judicial Council.

Report of Judicial Council relating to Allen County Medical Society of Indiana.

That all questions arising in or growing out of the communication from the Allen County Medical Society of Indiana be, and they are hereby referred, for action thereon, to the State

Medical Society of Indiana, for the reason that the matters in controversy, partly personal and partly of a society nature, involve questions which must be settled in accordance with its law, and which it has not decided. Also

That the Secretary be, and he is hereby instructed to forward the papers relating to this case and now in his hands, to the Secretary of the aforesaid State Medical Society.

S. N. BENHAM,
Secretary of Judicial Council.

Dr. WM. BRODIE presented the following:—

To the President and Members of the American Medical Association.

The undersigned, who were appointed at the last meeting of this Association as representatives to the Canada Medical Association, to be held in the city of London, Ont., on the 10th and 11th of September, 1879, respectfully report that they attended that meeting, and were received with cordiality and attention.

The meeting was well attended, and valuable papers were read and discussed in which we were invited to take part. They also showed that our brethren of the Dominion of Canada felt a pride and interest in their Association and its success. The Association was hospitably entertained by the profession of London, to which your representatives were invited. To the toast of "The Medical Profession of the United States," a high tribute was paid to American physicians and surgeons and to this Association. We congratulate our Canadian brethren on the growth and progress of their National Association, and recommend that the amenities so pleasantly begun be continued, and that the interchange of representatives and proceedings be indefinitely prolonged.

Dr. R. P. Howard, of Montreal, was elected President, and Dr. A. H. David, of Montreal, General Secretary. The Association adjourned to meet in the city of Ottawa, the seat of their general government, the first Wednesday in September, 1880.

It was received and ordered to be entered in the minutes.

Dr. FOSTER PRATT, of Michigan, presented the following from the committee on the propositions offered at last session by Dr. S. E. CHAILLÉ, of Louisiana.

Mr. President and Gentlemen:—

One year ago, Dr. S. E. Chaillé, of New Orleans, read before this Association a very interesting and elaborate paper advocating a "more efficient organization of this Association and its branches" with "greater uniformity, as well as greater strength of organization of the State medical societies and their auxiliaries," to the end, mainly, that State and local societies may exercise in their respective States and localities a greater and better influence on State medicine. Resolutions were also offered, by

the same gentleman, and adopted by the Association, directing the appointment of a committee of five to report at this meeting upon nine distinct propositions, or parts of a plan, suggested by the mover of the resolutions as the basis or beginning of a more uniform and a stronger organization of the medical profession in the United States.

These nine propositions are as follows:—

1. The compilation of a model code of detailed regulations for the government of State and county medical societies.
2. The requirement, from every State medical society, of an annual report to contain certain data to be specified and necessary to show the condition and progress of each of these State societies and of their auxiliary branches; to also contain a brief summary of the peculiarities of its organization, and of the measures being used by it to promote medical organization; and still further, to contain a brief summary of the laws of the State in reference to State medicine, and of the efforts being made to promote the practice of State medicine. Such reports should be published in the annual transactions of such societies.
3. The publication in the annual Transactions of this Association of a consolidated report of the above reports from each State, together with special notice of the meritorious work done by any of the branches of this Association.
4. The substitution of a periodical medical journal for the present annual volume of Transactions.
5. The non-recognition by this Association of State societies which make no provisions encouraging the organization of auxiliary societies in counties, etc.
6. The advisability of electing no person, either a permanent member or a member by invitation, unless such person be a member of a State medical society; provided, that there be such a society recognized by this Association in his State.
7. The advisability of refusing to admit to this Association delegates from societies auxiliary to a State society, unless the certificates of delegation be endorsed by an authorized officer of the State society.
8. The advisability of refusing to admit any delegates except those selected from and elected only by voting members who have paid all fees due to their respective county and State societies, and of establishing the principle that only such members of branch societies who are entitled to vote and have paid all fees due will be entitled to delegates.
9. The advisability of urging every medical college to have not less than one lecture delivered to every graduating class on the importance to the profession and to the people of medical organization.

Your committee having given these propositions the careful consideration to which they are entitled by their authorship,

by the importance of their subject matter, and by the action of this Association, now beg leave to report:—

The fifth of these propositions (for convenience and logical order) is first considered. It proposes *that this Association refuse to recognize all State societies which make no provision encouraging the organization of auxiliaries in counties, etc.*

The constituent elements of this Association are State and local societies and the medical departments of the army and navy; and its voting power is lodged in delegates from these constituent bodies; if, for good cause or manifest necessity, this voting power sees fit to change the constituent elements of this body or their mode of representation, it may very properly do so. But this is not a proposition to change these elements, or the system or the basis of their representation; it is a proposition to compel a constituent State society, under penalty of exclusion or expulsion from this body, to do, not here, but at home, a thing which, in appearance at least, relates mainly if not wholly to the internal affairs and local interests of the constituent itself. This, if adopted, involves a change of our constitution requiring a three-fourths vote of this Association, and your committee are of opinion that the proposition cannot be carried.

But, even if its adoption were practicable, your committee cannot believe it wise to make a change so radical in the organic *attitude* or *spirit* of this Association towards its constituents. Hitherto, the organic law of this Association has *demanded unity* only on its ethical code, and by manifest design permits or expects diversity in the details of State and local organization. It is a noticeable fact that the organic law of this body is so framed as to be in general harmony with the political institutions and habits of our people. The change proposed, if adopted, disturbs this harmony. For the republican idea, and a local control of local affairs, it would substitute, in effect, the monarchic idea and a central control; State societies, instead of being, as they now are, *constituent* bodies, with freedom of action in their domestic affairs, would soon become *subordinate* bodies subject to a central control in all things.

To confidently predict injury to our organic interests from such a change, it is not, by any means, necessary to assume that this Association, even if clothed with supreme or dictatorial power, would use it to oppress its constituents, or damage the profession. Discontent and division would, probably, spring, not so much from the thing done, as from the mode of doing it.

But, it may be said, that this proposed amendment of our organic law does not, if adopted, confer supreme power on this Association. True, in all things it does not; but it is, in fact, an *autocratic step*, and, if taken, it will be a precedent for other similar steps; and, if the ultimate step of such a series be dangerous, why take the first? *Obsta principiis!*

It may also be said, and truly, that all who dislike our ways, if out, can stay out; or, if in, can go out; but, in a body like this, such conditions are too much like those of a State, which repel the immigrant and expatriate the citizen.

Your committee are of the opinion, that such an attempt by this body to exercise dictatorial power in such matters on its constituent organizations would tend, invariably, to weaken the medical organization we have, and to correspondingly weaken its influence for good everywhere.

Observation seems to teach that scientific and other voluntary bodies, among an intelligent people, are conspicuously successful only when they copy, as nearly as may be, the forms and methods of their surrounding political institutions.

The medical and other scientific bodies of England, France, and Germany exercise a central and controlling power; they dictate forms of organization; they parcel out the powers and impose the duties of their subordinate bodies; they exercise, and are expected to exercise, supreme authority over all the purposes and interests of the general organization. There this is successfully and harmoniously done, because it is in accordance with the habits of a people educated and moulded by the autocratic method of their political institutions.

But in these United States scientific organizations of a national scope differ in form and method from all similar institutions in other parts of the world, just as and because our republican idea and plan of government differ from the monarchical and imperial idea and plan.

Each form has its advantages and its disadvantages; but, as before remarked, the rule seems to be that the success of such bodies depends on the degree to which they conform the voluntary to the political form of government. Especially is this true of scientific bodies, composed of people *attached*, as well as accustomed, to their political forms and methods; and the degree of that attachment accurately measures the danger of a neglect or violation of the prevalent susceptibilities.

Again, literature, art, and science, whether organized or unorganized, are, in a sense, republics; the influence and renown of each guild is due to the individual genius, the individual talent, the individual investigation, and the individual achievements of its members; republican by nature, they find a congenial home under republican institutions; and when so located, they will be and they should be doubly reluctant to adopt the forms and methods of autocracy or of imperialism, even though the end to be reached thereby seem to be desirable and proper.

Descending now from general to particular considerations, your committee calls attention to the fact that the proposition under consideration suggests that we refuse to recognize any State medical society that makes no provision "*encouraging* the organization" of county and local societies. Differences of

opinion must arise as to what does and what does not "encourage" such organization. It is within the knowledge of your committee that in some State societies the proposition to change their organic law to admit as voting members none but delegates from county or district societies, has been annually and for years under consideration; and the meditated change has been from year to year postponed, because local circumstances were such that the postponement policy, supplemented by individual effort in localities, was manifestly the best way to "encourage" auxiliary organizations. Especially is this true of States that embrace old and new settlements in nearly equal proportion. The new settlements are invariably, and for manifest reasons, jealous of the older and stronger districts; the strifes and rivalries for practice in new settlements and among a sparse but growing population, create professional antagonisms, which prevent local organization or make it difficult; but admitted individually to membership in the State organization, rivals have learned to be allies, and their voluntary action, better than compulsory influence, has secured the desired local result.

Your committee, for these and other reasons, recommend that this proposed amendment of our constitution be not adopted.

The first proposition of the series referred to your committee, and next to be considered, contemplates the preparation of a model code of regulations for the government of State and county societies.

Some State societies have already adopted model codes for their auxiliaries, and it might be well for some other State societies to follow the example; but your committee cannot advise the adoption of this measure by this Association; because, first, the adoption of such a code merely as a model, would assume an ignorance or a mental incompetency in the medical men of a State, which to many would be offensive; second, it would be impossible to frame a code which would be adapted to all local wants and necessities; and third, the old and well-established societies would not observe it. If the adoption or use of such a code by State and local societies is to be made obligatory, the objections given will all be intensified, and the requirements if made will remain a dead letter.

Proposition No. 2 suggests that this Association require from all State societies an annual report containing certain statistics. The proposed statistics if furnished occasionally would be convenient and more or less valuable as they are more or less accurate; but if they must be furnished annually in all the details proposed, your committee are of the opinion that the amount of labor required for their compilation will be seldom done; and that, even if done, the *annual* publication of the statistics, as suggested by proposition 3, would involve considerable expense without returning to us an equivalent value.

Propositions 6, 7, and 8 call for a consideration of the advisability of so changing the constitution as to refuse permanent membership and membership by invitation to all who are not members of a State society, if one exists where they live; also to require all credentials from local societies to be endorsed by the proper officer of the State society; and to receive as delegates only those who have paid all dues and who have been elected by members free of dues to the local and State societies.

Your committee are of the opinion that Section II., relating to "members," now a part of the constitution of this Association, contains all needful provisions on all these points, and it is, therefore, respectfully recommended that these propositions be not adopted.

Proposition 9 suggests that this Association urge every medical college to give a lecture or lectures to each graduating class on the importance to the profession and to the people of medical organization.

A resolution to this effect could do no harm, and might do some good; but as this Association, after much travail and tribulation, has delivered itself from all control of and all responsibility for medical schools, it may be with it a question of propriety or of dignity, whether it will volunteer advice where it cannot compel observance.

Proposition No 4, the only topic of the nine referred now remaining to consider, proposes "the substitution of a periodical medical journal for the present annual volume of Transactions."

This is an important subject. It has been repeatedly brought here; it was once referred to a committee that made no report; it is one that has been much discussed, and about the practicability of which there is and will be many and great differences of opinion. "It is a consummation devoutly to be wished;" and probably a very large majority of intelligent medical men will unhesitatingly declare in favor of the periodical—*if* it can be properly established and maintained.

Many of the objectionable things in our professional life and organizations are incidents—perhaps, for the present, they are necessary incidents—of a national and professional growth. While many individual men among us rank with the foremost medical men of the world, as a people we are young. Our professional organizations are young. Even this organization has been scarcely fourteen years out of its nursery—even now it has but reached puberty. There is in its organization and conduct much that is crude and immature. But let us be patient. The youth has done well—promises well—it may have some follies —but its *youth is not a fault.* It does not seem wise to meddle much—let it grow—let it develop, untrammelled by unnecessary and irksome restraint, into the noble and useful and balanced medical manhood of which its youth gives ample promise.

Finally, your committee are of the opinion that a "more effi-

cient organization of this Association," as well as "greater uniformity and greater strength of organization of State medical societies and their auxiliary branches," are good and desirable objects; but how are these objects to be attained without danger or injury to the organization we have, and without diminution of the good it is doing? This is the problem. In medicine, as in morals, many lawful and desirable things "are not expedient."

Your committee believe that the safest and surest way to attain most of the desirable ends proposed, is to patiently wait the operations of the law of growth. Growth is slow, and large bodies move slowly; it is also a well-known fact, in these days, that the march of a great army is measured not by the strength of the strong, but by the feebleness of the feeble. Let us be patient. County and district societies are springing into existence every year, especially in the younger States; the influences in favor of such organizations that emanate from this and from most of the State and local societies now in existence, are spreading year by year; the advantages offered by organization, to medical men everywhere, are better understood and valued as the years pass on; kindly encouragement and the welcoming hand, always extended by us to voluntary organizations, will, it is believed, bear more and better fruit than dictatorial and punitive measures. If we have unity in the essentials, we may well tolerate diversity in the non-essentials. For the present, the fundamental, the essential requirement is high character and honorable conduct in our members. This essential unity relates to men and not to measures. To this end, the recognition and observance of our ethical code are made obligatory on all organizations. This is our corner-stone. Its elements are few, but they are comprehensive—it expects every member of the profession to act as becomes a physician and a gentleman. This, for the time being, seems to be for us the only practicable unity. Time, and the laws of growth and of assimilation will do the rest.

FOSTER PRATT,
N. S. DAVIS,
S. D. GROSS,
A. N. BELL.

On motion of Dr. W. Brodie the report was accepted, and ordered to be entered on the minutes.

The Permanent Secretary read the following:—

Evanston, Ill., May 27, 1880.

J. M. Toner, M.D.

My Dear Doctor: To-day is the one set for me to start for New York to attend the meeting of the American Medical Association and the College Association, etc. But here I am confined to my house by a painful infirmity. It culminated in my utter prostration ten days ago, just as all materials were

ready for me to put together in the form of a short report in behalf of the Committee on Ozone, Electricity, etc., in connection with records of the commencement of diseases, hoping to meet you and the other members of the committee, namely, Drs. Billings, Geddings, and Marcy, for a conference in New York. My report, if I could have finished it, would have simply stated the difficulties we had found to exist in making continuous reliable records of the ozonic and electric conditions of the atmosphere—such as men of true science would regard as reliable—partly on account of the imperfections of tests and instruments, and partly from imperfections of knowledge, particularly in regard to what has been called ozone; the cost of such instruments as would be required if observations were undertaken; the readiness with which a sufficient number of active practitioners can be enlisted to record the commencements of all attacks of acute diseases in any desired number of localities, whether in cities or country places; still further urging the importance of having all our social organizations, local, State, and national, turn more of their attention to well-devised lines of investigation in all departments of medicine to be pursued from year to year, instead of relying, as heretofore, on mere individual, miscellaneous, and fragmentary communications; and finally, asking the Association to accept the report as one of progress, continue the committee, and authorize it to draw on the treasury for a sum not exceeding $200, to be spent for necessary instruments, if in the progress of its work during the coming year such expenditure should be found advisable. Such is a very brief but correct outline of the report I had intended to present to the committee, and with its approval to the Association.

But sickness has interfered, and I must submit with patience, leaving it to yourself and such other members of the committee as you can confer with to decide what it is best to do, and I shall be wholly satisfied with your action. I frankly acknowledge that the inability to attend the meeting in New York is a great disappointment to me and to my family. It is thirty-four years in May just passed, since, in the same city, I met the seventy or eighty noble representatives of our profession, who in assembly constituted the *preliminary convention* originating this Association. I have not strength or time to express the thoughts that crowd upon my memory at this moment. I will say, that through all those years I have faithfully endeavored to do all in my power to make the Association a great blessing to the profession in all its interests, and through it to mankind.

Through all those years I have been permitted, almost without interruption, to mingle in its annual reunions; profit by its accumulations of science; enjoy its social festivities; take a full share of its honors; and, what is more than all, receive from all its members that personal kindness and consideration for which I have no words to express my gratitude. That the present

meeting may be a most happy and profitable one, and that the Association may increase in strength and usefulness while time shall last, is the hearty wish of your most

Sincere friend,
N. S. DAVIS,
Chicago, Ill.

On motion of Dr. J. P. WHITE, of New York, the report was accepted, the committee continued, and the amount asked for appropriated.

Dr. J. S. LYNCH, of Maryland, Chairman of the Section on Practice of Medicine, etc., then delivered his address.

On motion, the address was referred to the Committee of Publication.

The President introduced Dr. CLEMENT A. WALKER, of Massachusetts, President of the Association of Medical Superintendents of Insane Asylums, and he was invited to a seat on the platform.

Dr. WM. T. BRIGGS, of Tennessee, Chairman of the Section on Surgery and Anatomy, then delivered his address.

On motion, it was referred to the Committee of Publication.

Several communications were presented, and referred to the appropriate Sections.

Dr. W. F. PECK, of Iowa, offered the following, which was referred to the Judicial Committee.

Submitted—

Have permanent members a voting power when the delegates from the different States assemble to select members for the Committee on Nominations?

W. F. PECK, *Iowa.*

The amendments and changes in the by-laws as offered in 1879 were then read, and unanimously adopted:—

1. Expunge from Section III. everything relating to Prize Essays and the Committee on Prize Essays.
2. Introduce into Section II. the following laws:—

Prize Essays.

a. There shall be four annual prizes of two hundred and fifty dollars each, which shall be awarded at the close of the second year after announcement, as hereinafter explained, for strictly original contributions to medical and surgical progress.

b. It shall be the duty of the chairman of each of the following four Sections: 1. Practical Medicine, Materia Medica, and Physiology; 2. Obstetrics and Diseases of Women and Children; 3. Surgery and Anatomy; 4. State Medicine and Public

Hygiene, to appoint annually before the adjournment of the meeting of the Association three members of ability and good judgment, who shall constitute a Committee of Selection, and who shall, within thirty days thereafter, select and publicly announce for competitive investigation and report, a subject belonging to one or other of the branches of medicine included in the title of the Section.

c. It shall also be the duty of the chairman of each of the Sections mentioned to appoint annually a Committee of Award, consisting of three experts, who shall carefully examine the essays offered for competition, and, if any one shall be found worthy of the prize as a substantial contribution to medical knowledge, to recommend the same to the Association.

d. All essays placed by their authors for competition shall be in the hands of the chairmen of the respective Committees of Award on or before the first day of January preceding the meeting of the Association at which the reports of the committees are required to be made.

e. All Prize Essays shall be considered as the property of the Association.

f. The names of the authors of the competing essays shall be kept secret from the committees by such means as the latter may provide.

g. Membership in either of the two committees shall not debar from membership in the other; nor shall membership in the Committee of Selection exclude a member from the privilege of offering a competing essay.

On motion of Dr. J. R. Bronson, of Massachusetts, the Metric System was made the special order for the morning.

On motion, adjourned to meet on Thursday at 10 A. M.

THIRD DAY.

Thursday, June 3.

The Association was called to order by the President at 10 A. M.

Dr. J. R. Bronson, of Massachusetts, offered the following, which was unanimously adopted:—

Whereas, The proceedings of this Association and its various Sections are not treated in a way to enable the profession to practically realize the labors of its members;

And whereas, The members of this Association have long felt that the present mode of introducing the Transactions to the profession has been unsatisfactory to all concerned in the advancement of medical science: Therefore,

Resolved, That a committee of *five* be appointed, to report

to-morrow morning, upon the practicability of formulating all of the proceedings in journalistic form as recommended by the President in his annual address.

By request of Dr. B. JOY JEFFRIES, of Massachusetts, the Permanent Secretary read the following:—

It has been proposed in the *British Medical Journal* to test for color-blindness the members of the British Medical Association at the next meeting at Cambridge.

As a similar contribution to science, Dr. B. Joy Jeffries, of Boston, asks the members of the American Medical Association to be tested by him in the parlor from now till two P. M.

At two P. M. he will explain methods of testing before the Section of Ophthalmology.

The report of the Executive Committee on the Metric System was called up, and, on motion of Dr. W. BRODIE, it was laid on the table for the present.

Dr. WM. O. BALDWIN, of Alabama, Chairman of the Committee on Nominations, presented the following partial report:—

The Committee on Nominations have the honor to submit the following nominations and recommendations:—

PRESIDENT.

Dr. JOHN T. HODGEN, *of Missouri.*

VICE-PRESIDENTS.

1. Dr. W. H. ANDERSON, *of Alabama.*
2. Dr. LEVI G. HILL, *of New Hampshire.*
3. Dr. HENRY D. HOLTON, *of Vermont.*
4. Dr. HORACE CARPENTER, *of Oregon.*

TREASURER.

Dr. RICHARD J. DUNGLISON, *of Pennsylvania.*

LIBRARIAN.

Dr. WM. LEE, *of District of Columbia.*

As Chairmen and Secretaries of the several Sections:—

1. Practice of Medicine, Materia Medica, and Physiology.—Dr. CHAS. DENISON, of Colorado, Chairman; Dr. T. A. ASHBY, of Maryland, Secretary.

2. Surgery and Anatomy.—Dr. HUNTER McGUIRE, of Virginia, Chairman; Dr. DUNCAN EVE, of Tennessee, Secretary.

3. Obstetrics and Diseases of Women.—Dr. JAMES R. CHADWICK, of Massachusetts, Chairman; Dr. JOS. TABER JOHNSTON, of District of Columbia, Secretary.

4. Medical Jurisprudence and State Medicine.—Dr. J. T. REEVE, of Wisconsin, Chairman; Dr. R. G. JENNINGS, of Arkansas, Secretary.

5. Ophthalmology, Otology, and Laryngology.—Dr. DUDLEY S. REYNOLDS, of Kentucky, Chairman; Dr. SWAN M. BURNETT, of District of Columbia, Secretary.

As members of the Judicial Council to fill the vacancies occurring at this meeting the following, viz.:—Drs. J. K. BARTLETT, of Wisconsin; F. STAPLES, of Minnesota; D. R. WALLACE, of Texas; J. G. THOMAS, of Georgia; J. S. BILLINGS, of the U. S. Army; JOSEPH H. WARREN, of Massachusetts; A. T. WOODWARD, of Vermont

The Committee recommend that the next meeting of the Association be held in the city of Richmond, Virginia, on the first Tuesday in May, 1881.

As Chairman of the Committee of Arrangements for that meeting, Dr. F. D. CUNNINGHAM, of Virginia.

The Committee further recommend that the Committee on Necrology, and the membership of the Section of Medical Jurisprudence, State Medicine, and Public Hygiene remain as now constituted.

On motion, the report was unanimously adopted.

Dr. CHAS. DENISON, of Colorado, having declined the nomination as Chairman of the Section on Practice of Medicine, etc., the matter was referred to the Committee on Nominations.

Dr. J. S. BILLINGS, of U. S. Army, presented the following report from the Committee on National Medical Library, which was accepted, and the Committee continued.

Your committee would respectfully report that the stereotype plates of the first volume of the subject Catalogue are nearly completed, and that it is expected that the volume will be issued next July.

The appropriation needed for the completion of vol. ii. has passed the House of Representatives, and it is believed will pass the Senate, so that it is hoped that no delay will occur. The appropriation was not large enough to warrant the printing of a large number of copies; consequently the Catalogue can only

be furnished to public libraries and institutions, and to a few persons who have contributed largely to the library; but any one can obtain it at its estimated cost, about $2.50 per volume, by notifying the public printer, and inclosing that amount at once for the volume in hand.

The *Index Medicus*, now in its second volume, is a supplement to this Catalogue. It takes up the work where the Catalogue leaves it on going to press, being a transcript of titles of current medical literature since January, 1879. As it is not a Government work, but the private enterprise of its publisher, Mr. F. Leypoldt, of New York, who is allowed to have copies made of the card catalogue of the library as the work progresses, its success depends upon the support it receives by subscription—at present inadequate. The Annual Index of Authors and Subjects is submitted to show the character and extent of this publication.

Although not immediately within the scope of its duties, the committee takes the opportunity to call the attention of the Association to the fact that the building at Washington in which the treasures of this Library and of the Army Medical Museum are stored, together with the medical and surgical records of the late war, is entirely inadequate to its purpose. It is much too small to permit of the proper classification of its contents; its walls are in bad condition, and although nominally fireproof, it has an ordinary wooden roof, and is closely surrounded by buildings of a very inflammable character.

It is the opinion of this committee that the Association should take some steps to signify to Congress its views as to the importance of at once providing a suitable building, surrounded by an open space, and thoroughly fireproof, which shall contain the Library, Museum, and Medical Records of the Army Medical Department.

H. C. WOOD, *Chairman*.

May 30, 1880.

The amendments to the Constitution, as offered last year by Dr. J. H. Rauch, were taken up and unanimously adopted.

Article II., second paragraph, after "Army and Navy" insert "and the Marine Hospital Service of the United States."

Article II., fourth paragraph, at the end insert "the Marine Hospital Service of the United States shall be entitled to one delegate."

Dr. S. C. Busey, of District of Columbia, stated that he had been directed by the temporary Section on the Diseases of Children to offer the following amendment to the By-Laws:—

Section II. Add to the first paragraph:—"Section VI. Diseases of Children."

On motion, the amendment was unanimously adopted, and the Committee on Nominations were requested to appoint the officers for the new Section.

On motion, the report of the Executive Committee on the Metric System was then taken up.

The report is as follows:—

Report of the Metric Executive Committee of the American Medical Association for 1879–1880.

At the last session of our meeting at Atlanta, Georgia, the following resolutions relative to the metric system were unanimously adopted:—

Resolved, First. That the American Medical Association adopts the international metric system, and will use it in its Transactions.

Second. Requests that those who present papers at its future meetings employ this system in their communications or reprints thereof.

Third. Requests the medical boards of the hospitals and dispensaries to adopt the metric system in prescribing and recording cases, and that the faculties of the medical and pharmaceutic schools adopt it in their didactic, clinical, or dispensing departments.

Fourth. Requests the physicians familiar with the metric system to help their *confrères* and the druggists in its application; and the delegates present at this session to work up the acceptance of the metric system by their respective county and State societies.

Fifth. Requests our President to name a metric executive Committee, of which he shall be the ex-officio chairman, and whose task will be to give unity and rapidity to this metric movement.

The Committee was composed, besides the ex-officio chairman, of MM. Edouard Seguin, of New York, Edward Wigglesworth, of Massachusetts, and J. R. Weist, of Indiana.

Not to rehearse the causes which have provoked the nominations of this Metric Executive Committee, let us point out the new ones which render a prompt resolution necessary.

Great changes are constantly taking place in our profession. As long as physicians had to deal almost exclusively with quantities sensible to the naked and unaided senses, the duodecimal computation—though tedious and unsafe in complex quantities—could have been serviceable. But now, and every day more and more, the vital questions of our art rest upon the analysis of quantities too small to be appreciated by the senses; quantities comprehensible and manageable only through the rational uniformity of which the metro-decimal system is the simplest exponent and expression.

We are not alone in this plight. In England, famed old surgeons like T. Holmes (see his letter of the 4th–8–1879, in Metric Note No. 7); men in the prime of their talents like Burdon Sanderson, Sydney Ringer, Earnest Hart, and the younger graduates of the London University Medical College, all agree that the metric system is the future quantitative language of our profession.

We stand about in the same relation to this progress as the English; you have created the present Executive Metric Committee; they have appointed Dr. Clifford Albutt, of Leeds; Dr. Lauder Brunton, F.R.S.; Dr Sieveking; Professor Frazer, Q.V. Edinburgh; Professor Harvey, University of Aberdeen; Dr. Quain, F.R.S., Chairman of the Pharmacopœia Committee, of the General Council, and Mr. Earnest Hart, Chairman of Council, a Committee to report on the means of introducing the metric system in medicine in Great Britain. This Committee will report at the next meeting of the British Medical Association in August, as we report to you now. Last year we ran with our English *confrères* the same noble race. Who will reach the goal first this time?

Considering also and above all the home question; any delay in the teaching of the metric system brings up new crops of physicians who—however capable otherwise—are incapable at first, and soon become unwilling to learn and use the quantitative language common to medicine, chemistry, pharmacy, physics, etc.: your Metric Executive Committee submits to your action the following propositions:—

The American Medical Association—1st. Recommends the teaching and practice of the metric system in medical colleges, clinics, dispensaries, etc.

2d. Charges its Executive Metric Committee with the duty to report annually on the above institutions which teach, and those who do not teach the metric system.

3d. Authorizes said Committee to enter into communication with the Metric Committee of the British Medical Association, in order to concert such plans as may render the use of the metric system simultaneous and uniform in both countries.

THEOPHILUS PARVIN,
Chairman Executive Metric Committee.
EDWARD WIGGLESWORTH,
J. R. WEIST,
EDOUARD SEGUIN, *Secretary.*

After prolonged discussion, on motion of Dr. E. B. Lyons, of Connecticut, the propositions with which the report closed were adopted by a large majority.

Dr. Dudley S. Reynolds, of Kentucky, offered the following:—

Resolved, That Congress be requested to remove every obstacle to the full execution of the plans of Dr. John Gamgee, for the building of a refrigerating ship, etc.

On motion of Dr. EZRA M. HUNT, of New Jersey, it was laid on the table.

On motion of Dr. W. M. BEECH, of Ohio, it was

Resolved, That a committee of five be appointed by the President, whose duty it shall be to try to secure for the medical staff of our army and navy a social recognition as officers in their respective companies, coequal with officers of like grade in the other departments of the service.

The Permanent Secretary read the following report of the Judicial Council:—

Whereas, A protest without signature, against the registration of the delegates from the Medical Staff of the U. S. Navy, and unaccompanied by charges, had been placed in the hands of the Judicial Council; therefore, be it

Resolved, That the protest against the registration of delegates from the Medical Department of the U. S. Navy is not sustained, and therefore there was no cause for action thereon.

Resolved, That the Hannibal Medical Society of Missouri is not entitled to representation in the American Medical Association, because it is not in affiliation with its own State Medical Society. The protest against it is therefore sustained.

Dr. GAMA LOBO, of Brazil, being present, was made a member by invitation, and invited to a seat on the platform.

Dr. JAMES F. HIBBERD, of Indiana, Chairman of the Section on State Medicine, etc., delivered his address.

On motion it was referred to the Committee of Publication.

The President announced the following committees:—

As ordered by the resolution of Dr. J. R. BRONSON—

On formulating the proceedings in journalistic form:—Drs. J. R. BRONSON, of Massachusetts; W. W. DAWSON, of Ohio; W. H. PANCOAST, of Pennsylvania; N. C. HUSTED, of New York; J. S. Green, of New Jersey.

On the recommendations in the President's address:—Drs. J. H. PACKARD, of Pennsylvania; S. D. GROSS, of Pennsylvania; J. S. WEATHERLY, of Alabama; E. S. DUNSTER, of Michigan, and W. R. GILLETTE, of New York.

Dr. J. M. TONER, of District of Columbia, then read portions of the Address on Necrology, which on motion was referred to the Committee of Publication.

The President appointed the following as delegates:—

To European Societies:—Drs. R. BEVERLY COLE, of California; JOSEPH H. WARREN, of Massachusetts; SAMUEL D. GROSS,

and BENJAMIN LEE, of Pennsylvania; MONTROSE A. PALLEN, L. DUNCAN BULKLEY, and J. C. HUTCHISON, of New York.

To the Canadian Medical Association:—Drs. C. N. BRUSH, JAMES R. LEAMING, D. H. GOODWILLIE, of New York; WILLIAM BRODIE, of Michigan; WILLIAM B. ULRICH, of Pennsylvania.

The Permanent Secretary read the report of the Librarian, which, on motion, was received, referred to the Committee of Publication, and the amount asked for, $200, granted.

On motion, adjourned to meet on Friday at 10 A. M.

FOURTH DAY.

FRIDAY, June 4.

The Association was called to order at 10 A. M. by the President.

The President announced as the Committee on the social position of members of the medical staff of the army and navy:—Drs. W. M. BEECH, of Ohio; C. G. GOODBRAKE, of Illinois; HUNTER McGUIRE, of Virginia; WM. T. BRIGGS, of Tennessee; and D. W. YANDELL, of Kentucky.

A communication from C. W. STILLMAN, of New Jersey, offering the sector splint, and his letters patent therefor, to the Association, was, on motion, laid on the table.

The Permanent Secretary read a communication from Dr. FRED. W. HORNER, of Virginia, which, on motion, was received.

"*Whereas*, Amid the misfortunes incident to human life, examples of destitution occur among the families, the widows and orphans of deceased physicians in this country; therefore, be it

Resolved, That the Fellows of the State Medical Society of Virginia do hereby instruct their delegates to the approaching meeting of the American Medical Association to bring before that body the subject of the organization of a *Mutual Medical Aid Association*, and do invite their co-operation to carry out successfully this beneficent scheme for the relief of our medical brethren by the appointment of a *Committee of Benevolence*.

SALEM, FAUQUIER CO., VA.,
May 31, 1880."

HON. LEWIS A. SAYRE, M.D.,
President American Medical Association.

MY DEAR DOCTOR: Herewith find inclosed my appointment by the State Medical Society of Virginia as a delegate to the American Medical Association. I had hoped to be able to present the above resolution in person, but a severe domestic afflic-

tion will prevent my attendance. I will beg the favor of you to ask Dr. Atkinson, your Secretary, to read it to the Association, with the *hope* that you will add the statement expressed in your late letter to me, that "it is a noble object and deserves the favorable consideration of every man in the profession." The inclosed will be handed to you by Dr. Gustave B. Thornton, President Board of Health of Memphis.

Very respectfully your ob't serv't,
FREDERICK HORNER, Jr., M.D.,
U. S. Navy.

A resolution offered by Dr. JOHN OCTERLONEY, of Kentucky, disapproving of the gratuitous distribution among the laity of medical journals, was, on motion, laid on the table.

Dr. BENJAMIN LEE, of Pennsylvania, presented the following, which, on motion of Dr. J. F. HIBBERD, was received and referred to a committee consisting of Drs. B. LEE, H. LENOX HODGE, of Pennsylvania, H. G. PIFFARD, of New York, S. W. GROSS, of Pennsylvania, and J. S. GREEN, of New Jersey:—

HALL OF THE PHILADA. COUNTY MED. SOCIETY,
PHILADELPHIA, May 31, 1880.

Dr. LEWIS A. SAYRE,
President American Med. Association.

DEAR SIR: I have been instructed by the Philadelphia Co. Medical Society to transmit to the American Medical Association, through you, its honored President, the accompanying report on the "Abuse of Medical Charities" in the city of Philadelphia. This report is the result of the labors of the "Committee on Hygiene and the Relations of the Profession to the Public," with the addition of other members for the express purpose of considering this important subject. They were ably seconded in their investigations by a Committee of the "Philadelphia Society for Organizing Charitable Relief," of which the Chairman was Dr. H. Lenox Hodge, and the Secretary Dr. Charles E. Cadwalader. These investigations extended over a period of eighteen months, and the results arrived at by their means were considered of sufficient importance by the Society to warrant their presentation to the profession at large through the auspices of your distinguished body.

There is no large city, either in this country or abroad, where such abuse is not felt to be a growing and a portentous evil, threatening the independence, self-reliance, and self-respect of great masses of the population, and educating a race of paupers on the one hand, and depriving the young and struggling practitioner of his just means of livelihood on the other. The Philadelphia County Medical Society trusts that this contribution to the solution of this most difficult problem may prove to be not without value to philanthropists in other cities who are already

struggling with it. Accompanying the Report is an extract from a "Plan for Co-operation of the Medical Charities of the City of Philadelphia with the Ward Associations of the Philadelphia Society for Organizing Charity," by means of which a searching investigation of the circumstances of applicants for medical relief is contemplated.

I have the honor to be, Dear Sir,

Yours, with great respect,

BENJAMIN LEE,

Chairman "Committee on Hygiene and the Relations of the Profession to the Public," Philada. Co. Med. Society.

Dr. A. L. CARROLL, of New York, offered the following:—

Whereas, The County Medical Society of New York has admitted to membership graduates of schools not recognized by this Association; therefore, be it

Resolved, That Societies which admit irregular practitioners to membership be debarred from representation in the American Medical Association.

On motion, it was referred to the Judicial Council.

The Treasurer's report was read, showing a balance of $579.59.

On motion, it was received, and referred to the Committee of Publication.

The Committee of Publication presented their report, which was read, and, on motion, it was received and referred to the Committee of Publication.

The Permanent Secretary read a part of a report by Dr. LAURENCE TURNBULL, of Pennsylvania, from the foreign delegation of 1879.

On motion, it was received and referred to the Committee of Publication.

On motion of Dr. FOSTER PRATT, it was

Resolved, That the Committee of Arrangements be and it is hereby instructed to prepare and present to the Association at the morning session of its first day's meeting at Richmond, a programme of the general business of this Association for the entire four days of its session.

Resolved, That the Committee of Arrangements having charge of the business and programme of the next meeting of this Association be, and it is hereby instructed to so place the proposed and pending amendment of the Code of Medical Ethics on the programme of the next meeting that it shall be the special order for 10.30 o'clock A. M. of the second day of said meeting, and to remain the special order until disposed of.

The Committee on Nominations presented their final report, which, on motion, was adopted.

In addition to the nominations previously reported, the Committee respectfully submits the following:—

As Chairman of the Section on Practice of Medicine, Materia Medica, and Physiology, in place of Dr. DENISON, who has declined, Dr. WILLIAM PEPPER, of Pennsylvania.

Section on Diseases of Children.—Dr. A. JACOBI, of New York, Chairman; Dr. W. H. BRADFORD, of Massachusetts, Secretary.

Assistant Secretary, Dr. J. GRATTAN CABELL, of Virginia.

Committee of Arrangements.—Drs. F. D. CUNNINGHAM, H. MCGUIRE, and J. D. CULLEN, of Richmond, Va., with power to select others to make a committee of seven.

Committee of Publication.—Drs. WM. B. ATKINSON, THOS. M. DRYSDALE, WILLIAM LEE, R. J. DUNGLISON, ALBERT FRICKE, SAMUEL D. GROSS, CASPAR WISTER.

The Committee also recommend that the following resolutions, passed by the Association last year at Atlanta, be recognized as remaining in force until further order by the Association, viz.:—

"That the Committee of Publication be instructed to advertise for proposals to publish the Transactions of this Association in six of the largest cities of the Union, and that the contract be awarded to the lowest and best responsible bidder.

"That the Treasurer be instructed to deposit the funds of the American Medical Association monthly as Treasurer in the name of the Association in the Farmers' and Mechanics' Bank of Philadelphia.

W. O. BALDWIN, M.D., *Chairman.*"

Dr. H. G. PIFFARD, of New York, offered the following, which was, on motion, referred to the Judicial Council:—

Resolved, That the representation of the Richmond County Society of New York be disbarred from membership in the American Medical Association for admitting an ex-homœopath as a member.

Dr. JAS. M. KELLER, of Arkansas, offered an amendment to the by-laws, which was laid over until next year.

In the election of officers and appointment of committees by this Association and its President, they shall be confined to members and delegates present at the meeting, except in the Committees of Arrangement, Climatology, and Credentials.

On motion of Dr. M. A. PALLEN, the rule requiring the advertisement for proposals for publishing the Transactions was reconsidered, and on motion it was unanimously agreed that the publication be assigned to the same publishers as in 1879.

The Sections reported their minutes and accompanying papers, which were severally referred to the Committee of Publication.

Dr. Wm. Brodie offered the following, which was adopted unanimously by a rising vote:—

Resolved, That the thanks of this Association be and are hereby tendered to His Honor Mayor Cooper and lady, Mr. August Belmont and lady, Drs. Fordyce Barker and T. Gaillard Thomas, to the President and Vice-President of the Academy of Medicine, to Postmaster James, of New York, to the officers of the Western Union Telegraph Company, to the officers of the Young Men's Christian Association for their many courtesies, and to the medical profession of the city of New York for their courteous attention in making this meeting pleasant and profitable. Also to the Faculty of the College of Physicians and Surgeons for the use of their building; to the press and Dr. George F. Shrady, editor *Medical Record*, for publishing a daily record of the proceedings; to Messrs. W. Wood & Co. for the interesting steamboat excursion; to Messrs. Reed and Carnick, Scott and Bowne, and the Pharmacal Association for the magnificent entertainment given at Booth's Theatre; and to all others who may have added to the entertainment and pleasure of the members during the session.

A special vote of thanks was tendered to the Committee of Arrangements.

Dr. H. O. Marcy, of Massachusetts, offered a resolution that the usual honorarium of $600 be granted to the Permanent Secretary, which, on motion of Dr M. A. Pallen, was made $1000, and the resolution was unanimously adopted.

On motion of Dr. Jas. F. Hibberd, from the Section on State Medicine, it was

Resolved, That a general sanitary organization is a necessity of every enlightened commercial nation, and that the service of the National Board of Health of the United States since its organization has been such as to impress us that both in its *personnel* and organization it is entitled to the confidence of the Government and the people, and we join the American Public Health Association and the National Academy of Sciences in earnestly recommending to Congress that the suggestions and estimates of the Board receive their legal sanction, believing that the money asked for is necessary to the work of the Board, and will be a most judicious expenditure of public money.

Resolved, That this Association approves the plans proposed by the Superintendent of the Tenth Census for the collection of data with regard to the insane and idiots of the United States, and it urges upon all physicians that they should aid in every

suitable way the efforts of the Census Bureau to perfect its statistics in regard to idiots and the insane.

Whereas, The value of vital statistics depends upon their scientific accuracy as regards their etiology as well as diagnosis of diseases, therefore be it

Resolved, That this Association recommends that each medical school establish a chair on State Medicine as an essential part of its curriculum.

Resolved, That the Section now known as that of State Medicine, Public Hygiene, Medical Jurisprudence, etc., be hereafter designated simply "State Medicine;" it being understood that the various subjects heretofore named in the title, and all other subjects for the execution of which State authority is necessary, are included under the said Section.

He also announced that this Section had selected as their Committee on Prize Essays under the amendment to the Constitution just adopted: Drs. S. E. CHAILLÉ, of Louisiana, J. L. CABELL, of Virginia, and A. N. BELL, of New York.

Dr. R. P. HOWARD, as President of the Canadian Medical Association, desired, on behalf of that body and of the medical profession of Canada, to return thanks for the many courtesies and attentions extended to them by the American Medical Association, and for the privileges they had enjoyed in being permitted to attend and take part in the meetings of the various sections of that body, representing, as it does, the learning, experience, and practical ability of the entire medical profession of the United States. He felt specially grateful for the honor done the Canadian delegates in making them, by a unanimous vote, Honorary Members of the American Medical Association. Should any members of that body attend the approaching meeting of the sister association to be held in Ottawa on the 1st of September next, Canadians will endeavor in some small degree to reciprocate the hospitable and generous treatment they have been the subjects of at the hands of their American cousins. Finally, he gladly availed himself of this, the first opportunity afforded him, to convey to the "National Board of Health" of the United States, the thanks of the "Canada Medical Association" for the courteous manner in which the Board has sent its valuable journal, "The Bulletin," to the President of the Canadian Association.

Dr. J. R. BRONSON offered the following:—

The committee appointed to consider the practicability of formulating all the proceedings of this Association in journalistic form, find on approaching the subject that its merits are such as to warrant the belief that the medical profession as a whole, upon due consideration, will heartily endorse the radical change proposed, in that it will enable the profession aforesaid to commence to utilize at an early day the valuable contributions to the literature of this Association. The details necessarily incident to the change proposed are too important and too numerous to be compassed within the period given the committee to report. We desire, therefore, to report progress.

Signed in behalf of the committee.

J. R. BRONSON, *Chairman.*

A motion to lay the report on the table was lost, and, on motion of Dr. WM. BRODIE, the report was accepted, and the committee continued.

The President elect, Dr. JOHN T. HODGEN, of Missouri, was then introduced, and thanked the Association for the honor conferred upon him by their choice of him as President.

Dr. JOHN L. ATLEE, of Pennsylvania, moved a vote of thanks to Dr. LEWIS A. SAYRE for the able and efficient manner in which he had performed the duties of President at this session, which was unanimously adopted by a rising vote.

Dr. SAYRE responded with much feeling, and thanked the members of the profession for the many kindnesses which had been extended to him, and particularly for the numerous manifestations of sympathy which he had received from all over the world in the hours of his great bereavement.

On motion of Dr. WM. BRODIE, the Association adjourned to meet in Richmond, Virginia, on the first Tuesday in May, 1881.

WILLIAM B. ATKINSON,

Permanent Secretary.

NOTE.—The following telegram was not received by the Secretary until after the adjournment of the Association. It and the letter from Dr. Chaillé are here appended at the request of the State Medical Society of Nebraska.

WM. B. ATKINSON,
Permanent Secretary.

UNIVERSITY OF LOUISIANA, MEDICAL DEPARTMENT.
NEW ORLEANS, July 23d, 1880.

DR. A. S. v. MANSFIELD,
Secretary Nebraska State Medical Society.

DEAR SIR: It has given me great satisfaction to read the following telegram from your society to the American Medical Association:—

NEBRASKA STATE MEDICAL SOCIETY.

"W. B. ATKINSON, M.D.

We congratulate the American Medical Association on its success, and claim that we have ever been loyal to its constitution and to its code.

It is no fault of ours that proper legislation has not been obtained. Twelve other States are similarly situated. We recommend the Illinois laws. Our financial standing is good; out of debt, and money in the treasury.

We have never indorsed advertisements contrary to the code; no members have withdrawn from the society; our attendance and membership averages with any new State.

In loyalty to the science of Medicine and to a proper regard for all the Ethics, the Nebraska State Medical Society challenges comparison with older societies.

A. S. v. MANSFIELD, Secretary,
Nebraska State Medical Society.

HARVEY LINK, President."

This telegram emphatically contradicts the following passage in my report on State Medical Societies to the American Medical Association in 1879:—

"This society is reported to be in bad financial condition because of debt incurred in publishing in 1877 its Transactions. It is also reported to have indorsed the advertisements of some of its members, which were deemed to violate the code of ethics; and that as results thereof a number of members abandoned the society, and anticipate forming a new organization."

My only explanation is, that the information contained in the above extract was procured from what I had reason to believe was a reliable source; and that I had not time nor opportunity to secure additional reports. I congratulate you heartily on the satisfactory condition reported.

Yours, very truly,

STANFORD E. CHAILLÉ.

MINUTES OF THE JUDICIAL COUNCIL.

THE Judicial Council met in Association Hall, New York, June 1, 1880.

Members present: Drs. BALDWIN, BARTLETT, BENHAM, PRATT, HOWARD, LINTHICUM, TONER, and STORMONT.

Dr. BALDWIN moved that Dr. TONER be made Chairman of the Judicial Council for the present meeting; carried, and, on motion, Dr. BENHAM was re-elected Secretary.

Dr. PRATT moved that a sub-committee of one, consisting of Dr. HOWARD, take all the papers relating to the registration of delegates from the Navy, examine the same, and report at the next session of the Council; also, that Dr. BENHAM, the Secretary, be requested to examine the papers relating to the Allen County Medical Society of Indiana, and report upon the same at our next session. Carried.

The second session of the Judicial Council was held in Association Hall, June 2, 1880, Dr. TONER in the Chair. Drs. BALDWIN, BARTLETT, BENHAM, HOWARD, and PRATT, present.

Dr. BARTLETT moved that, inasmuch as the chairman of the committee on rules and regulations is absent, the same committee be continued, and be requested to report without fail at our meeting next year. Carried.

Dr. BALDWIN moved that five members constitute a quorum for the transaction of business at the present meeting of the Judicial Council. Carried.

Dr. BENHAM then reported the result of his examination of the papers relating to the Allen County Medical Society of Indiana, after which Dr. PRATT moved that all questions arising in, or growing out of, the communication from the Allen County Medical Society of Indiana be, and they are hereby referred for action thereon to the State Medical Society of Indiana, for the reason that the matters in controversy, partly personal and partly of a Society nature, involve questions which must be settled in accordance with its law, and which it has not decided. Also,

That the Secretary be and he is hereby instructed to forward the papers relating to this case, and now in his hands, to the Secretary of the aforesaid State Medical Society. Carried.

Dr. HOWARD reported upon the matter relating to the protest against the registration of delegates from the Medical Staff of the Navy, and on motion of Dr. BARTLETT the report was received; after which Dr. PRATT offered the following, which was adopted as the decision of the Council:—

Whereas, A protest, without signature, against the registration of delegates from the Medical Staff of the Navy, on which the Committee of Arrangements had refused them registration, was presented by the said committee to the Association, and by it referred to the Judicial Council but unaccompanied by charges, specifications, or proof; therefore,

Resolved, That the protest against the registration of the delegates to this Association from the Medical Department of the Navy is not sustained, and the Council find no cause of action thereon.

The third session of the Judicial Council was held Thursday morning, June 3, 1880, Dr. TONER in the chair; Drs. BARTLETT, BENHAM, PRATT, and STORMONT present.

Dr. BENHAM read the protest in reference to the admission of delegates from the Hannibal Medical Society of Missouri. As witnesses, Drs. J. S. Jillett and J. C. Hearn were examined in reference thereto, after which Dr. BARTLETT offered the following:—

Resolved, That the Hannibal Medical Society of Missouri is not entitled to representation in this Association, because it is not in affiliation with the State Medical Society. The protest against the registration of its delegates is therefore sustained.

The following questions were then read:—

To the President of the American Medical Association:—

We desire to submit the following questions, and respectfully request that the same be referred to the Judicial Council for answer, viz.:—

1. Would a gentleman who has certificates of five (5) years' study, two (2) years at Olmutz and three (3) years at Perth, Hungary, be eligible to membership in the American Medical Association? A gentleman possessing the above qualifications was admitted to a local medical society in Arkansas. Is such relationship ethical, under the Code of the American Medical Association?

2. Would a gentleman having a certificate from the State Board of Health of Illinois or from its State Medical Society be eligible to membership in the American Medical Association?

E. R. DUVAL, M.D.,
E. T. DALE, M.D.,
J. A. DIBRELL, Jr., M.D.
Delegates from Arkansas State Medical Society.

To the above questions the Judicial Council answered as follows:—

Answer to the first question: If the gentleman in question be a member in good standing of the State Medical Society of his State, or of one of its regularly recognized auxiliary societies, and is regular in practice, he is, if duly elected and accredited by either State or local society of which he is a member, entitled to membership in this Association.

The answer to the second question is the same as the answer to the first question.

Members of the Judicial Council.

1881.	1882.	1883.
S. N. Benham, Pa.	W. O. Baldwin, Ala.	J. K. Bartlett, Wis.
J. M. Toner, D. C.	N. S. Davis, Ill.	F. Staples, Minn.
D. A. Linthicum, Ark.	John P. Gray, N. Y.	D. R. Wallace, Texas.
Foster Pratt, Mich.	E. L. Howard, Md.	J. S. Billings, U. S. A.
A. Woodward, Conn.	A. N. Talley, S. C.	J. H. Warren, Mass.
J. H. Van Deman, Tenn.	D. W. Stormont, Kan.	A. T. Woodward, Vt.
R. N. Todd, Ind.	Joseph P. Logan, Ind.	J. G. Thomas, Ga.

S. N. BENHAM, M.D.,
Secretary of Judicial Council.

REPORT OF THE COMMITTEE OF PUBLICATION.

JUNE 1, 1880.

THE Committee of Publication have the honor to submit the following Report:—

The Committee appointed at the last annual meeting of the Association consisted of Drs. Wm. B. Atkinson, T. M. Drysdale, Albert Frické, Samuel D. Gross, Caspar Wister, R. J. Dunglison, and William Lee. The meetings of the Committee were held at the office of Professor Gross, at the first of which Dr. Frické was chosen Chairman and Dr. Dunglison Secretary.

Immediately upon their organization they took active measures to meet the wishes of the Association as expressed in the following Resolution, passed at the last annual meeting, held at Atlanta, in May, 1879:—

Resolved, That the Committee of Publication be instructed to advertise for proposals to publish the Transactions of this Association in six of the largest cities of the Union, and that the contract be awarded to the lowest and best responsible bidder.

Estimates were obtained, as herewith submitted, in response to proposals duly issued to eight cities, New York, Boston, Cincinnati, Chicago, St. Louis, Brooklyn, Baltimore, and Philadelphia. The responses were in reply to the Committee's queries as to cost of composition per 1000 ems, presswork per token, paper per ream, and binding as per sample.

The estimates are as follows:—

From Houghton, Osgood & Co., Cambridge, Mass.

Composition, plain, per 1000 ems	$ 75
" tabular "	1 50
Alterations per hour	50
Presswork per token	62
Paper (50 lbs.) per ream	5 00
Binding per copy	20 to 30

From A. Williams & Co., Boston.

Composition per 1000 ems	$ 82
Presswork per token	1 00
Paper per ream	6 60
Binding per copy	31

From D. Appleton & Co., New York.

Composition per 1000 ems	$ 75
Presswork per token	75
Paper per ream	7 00
Binding per copy	35

From G. P. Putnam & Sons, New York.

Composition per 1000 ems	$ 70
Presswork per token	70
Paper per ream (55 lbs.)	5 80
Binding per copy	27

From John W. Woods, Baltimore.

Composition, plain, per 1000 ems	$ 70
" tabular "	1 00
Presswork per token	45
Paper per ream	5 75
Binding per copy	25

From Peter G. Thomson, Cincinnati.

Composition per 1000 ems	$ 60
Presswork per token	50
Paper (11 cents per lb.)	6 60
Binding per copy	30

From J. B. Lippincott & Co., Philadelphia.

Composition per 1000 ems	$ 70
Alterations per hour	45
Presswork (1000 copies) per token	70
" (1250 ") "	65
" (1500 ") "	60
Paper per ream	5 40
Binding per copy	23
Insertion of plates charged extra.	

From Sherman & Co., Philadelphia.

Composition per 1000 ems	$ 60
Presswork per token	55
Paper per ream	6 00
Binding per copy	21

From T. K. Collins, Philadelphia.

Composition per 1000 ems	$ 60
Presswork per token	50
Paper per ream	6 00
Binding per copy	21

Messrs. John Murphy & Co., of Baltimore; Cushings & Bailey, of Baltimore; Jansen, McClurg & Co., of Chicago; and Wm. Wood & Co., of New York, declined to furnish estimates.

A careful consideration and absolutely impartial analysis of these estimates were made by the Committee, and in accordance

with those submitted, the Collins Printing House, being the lowest responsible bidder, was duly awarded the printing of Vol. XXX. of the Transactions.

Strenuous efforts were made by the Committee to procure an early publication of the Volume of Transactions, but it was found impracticable to accomplish this result until the last days of 1879. It is always difficult to publish a volume abounding in papers by numerous contributors, with the same facility and rapidity as the work of a single author, especially as each one so contributing is anxious to obtain proofs of his paper, and not always so prompt in returning them, even though he may be resident at a distance or most earnestly reminded by the Committee of the stringent rules adopted by them for their guidance in this particular. Delay is especially augmented in the case of reports or papers containing illustrations, the proof of which, in most instances, must be seen repeatedly by the author, to insure accuracy and to give them their full value. In one case, notwithstanding the urgent appeal of the Committee by correspondence and telegrams, they were delayed for three or four weeks by the absence in Europe of the author of an important paper and the non-forwarding of proofs by a member of his family, who was desirous that the Committee should await his expected return. The duty entailed on the Committee by the Association itself of inviting bids for the publication of the Transactions was also a cause of delay, inasmuch as time was necessarily consumed in the analysis and consideration of the various estimates offered for the decision of the Committee.

All of which is respectfully submitted.

ALBERT FRICKÉ,
Chairman.

REPORT OF THE TREASURER.

THE Treasurer has the honor to report the balance in the Treasury at this date to be $570.59. The last annual meeting at Atlanta, Georgia, did not, in point of numbers, add very largely to the financial resources of the Association. In his last Report, the Treasurer called attention to the fact that a large number of the Permanent Members, who joined the Association in 1876, had not since exhibited any interest in it by the payment of annual dues. A special effort was made to procure the retention of membership by these gentlemen, but it was attended with very slight success.

All of which is respectfully submitted.

RICHARD J. DUNGLISON,
Treasurer.

Richard J. Dunglison, Treasurer, in account with the American Medical Association.

DR.

1879.			
June 1.	Cash balance	. . . .	$1245 66
	"	from Delegates and Permanent Members at Atlanta meeting, less exchange	1396 50
1880.			
May 29.	"	from Permanent Members to date	2482 84
			$5125 00

CR.

1879.			
May 20.	Cash paid	Dr. J. P. Logan, Chairman of Committee of Arrangements	$66 35
July 19.	"	Dr. A. McLane Hamilton, Prize Essay, as per order of Association	100 00
" 28.	"	Dr. Wm. Lee, Librarian, as per order of the Association	200 00
Oct. 24.	"	M. Lewis, per Secretary, for addressing wrappers, etc., ...	11 50
Nov. 17.	"	Dr. W. B. Atkinson, Secretary, as per order of the Association	600 00
Dec. 27.	"	Henry M. Barnes, services as Clerk . .	50 00
1880.			
Jan. 7.	"	T. K. Collins, bill for printing Vol. XXX. of Transactions, 1500 copies, paper, engraving, binding; also printing cards, circulars, notices, stamped envelopes, etc., ...	3251 68
May 15.	"	Dr. W. Lee, Librarian, postage, stationery, freight, etc., ...	20 00
"	"	H. C. Lea, cash advance in distribution of Transactions	90 74
"	"	Expenses of postage, stationery, freight, etc.,	35 49
"	"	Dr. Wm. B. Atkinson, Secretary, expenses, freight, postage, etc., ...	128 65
May 31.	Cash balance	. . . .	570 59
			$5125 00

Audited and found correct.

THOMAS M. DRYSDALE,
ALBERT FRICKÉ,
SAMUEL D. GROSS,
WM. B. ATKINSON,
Committee of Publication.

REPORT OF THE LIBRARIAN.

LIBRARY OF THE AMERICAN MEDICAL ASSOCIATION.

MR. PRESIDENT:—

From a quiet, but commodious and comfortable corner of the Smithsonian Institution—thanks to the courtesy of Prof. S. F. Baird, Secretary of that Institution, and of those associated with him—I have the honor to make this my annual report as Librarian. The accompanying catalogue will show that during the past year there have been added to the library 229 distinct titles, exclusive of yearly volumes of transactions of societies, reports of hospitals, boards of health, and volumes of medical journals, where these have been previously catalogued as such. This addition makes the library to consist at present of 1302 distinct titles, which comprehend, from a general estimate, about 3268 volumes, inclusive of pamphlets. A large proportion of these volumes have been received, as usual, in exchange, but there have been some donations which from their nature deserve especial mention here, as the library is indebted to Dr. E. C. Bright, of Eminence, Kentucky, for a large and valuable contribution of rare works; to Dr. G. S. Franklin, of Chillicothe, Ohio, for a similar contribution; to Dr. Wm. H. Sharp, of Chillicothe, Ohio, for a number of rare works, among which is to be found Vanguion's Surgery, edition of 1699; to Dr. D. N. Porter, of Eminence, Kentucky, Dr. Chas. E. Lining, of Evansville, Indiana, Dr. S. J. Radcliffe, of Washington, D. C., who, as heretofore, has materially assisted in completing sets of medical journals, etc.; and to Dr. J. Z. Gerhard, of Harrisburg, Pa. Other gentlemen have, as will be seen by the catalogue, contributed their own publications in a generous manner.

The question is so often asked, Of what use is this library? that it may not be out of place here to repeat what has been set forth in previous reports. The library serves a threefold purpose:

1st. It is intended as a repository for American medical literature, to gather in all, however important or insignificant, from the handsome quarto to the two-paged pamphlet, that is published in this country: it is doing this at present but very imperfectly; its files of medical journals and transactions of societies are in a fair way of being reasonably complete; its monographs and pamphlets are increasing in an encouraging manner, but for the more expensive publications that take rank as textbooks, it would seem that the library will have to wait until they become antiquated and out of date. Take this present meeting in New York, the great medical centre of this country, her representation of delegates, many of whom have been members of the Association from its earliest years, includes writers of works which stand before the profession to-day as valuable authorities on medical subjects, and which have gone through several editions, yet none of these works are to be found in the library—or if here and there a stray volume be found, it was obtained through some other than its author. As many members probably know to their cost, medical libraries form, to the individual, one of the least profitable of investments; as a collection of books their depreciation in money value becomes very great within a very short space of time—due in part to the rapid multiplying of succeeding editions of the same work, with revisions and additions which sometimes promise much more than they fulfil. As a consequence, the legacy of a library which the medical man leaves to his too often needy family, comes finally to be picked over here and there by the curious in the second-hand bookstore, or in the old rags, paper, and junk shops, where a once costly book, now coverless and torn, may be purchased for a quarter or so, at so much per pound.

2dly. This library is at the service for consultation of over 2000 medical men, members of the Association, and through them of their neighbors, provided they are willing to expend the cost of transportation and ready to make good any possible loss or damage. This cost of transportation at the present rates of book post is a mere nominal sum, and in this way the library is at the disposal of every country town or village throughout the United States. Members at this meeting from distant parts of the country will, many of them, look with interest at the valuable and extensive collections of books which New York

and our other eastern cities possess, for this seems to be an era of libraries and the utilizing of the same through the perfected index; and they will probably go home somewhat dissatisfied with their own limited range of literature; yet they could assist in building up a library which, as has just been said, they would have the right to consult, without favor or obligation, while the libraries which they find among us are all, without exception, to serve a limited purpose when taken in this sense.

3dly. This library serves the purpose of sending abroad without cost, through the exchange system of the Smithsonian Institution, the Transactions of this Association to every foreign institution which appreciates the matter contained therein, and to those only, as evidenced by their willingness to return the compliment and send their own publications in exchange. How far this has been done with advantage to the library, can be readily shown by consulting the yearly catalogues, when it will be found that these valuable foreign publications comprise a large proportion of the books received.

I therefore ask that the members who read this, take into serious consideration the expediency of sending copies of all of their own publications that are at their disposal, as well as all other medical publications of which they have duplicates, or which no longer serve the purpose of a library for consultation; and would especially call the attention of editors of medical journals to this request, in consideration of the large mass of material which accumulates in their offices. Some of this matter might prove to be in duplicate, but duplicates are always very useful to a library, and the library cheerfully pays the cost of transportation for all such.

I have no new suggestions to offer for this year, assuming that the home and foreign exchanges will be allowed to go on as usual: last year's appropriation is being utilized for the purposes for which it was intended; the price of binding material having been raised, the cost of binding is correspondingly greater, being now 50 cents instead of 45 cents per volume. To enable the librarian to continue this work throughout the coming year, and to purchase such periodicals and society transactions as are necessary to complete sets, and having become rare are not obtainable in any other way, I would ask for the appropriation of $200.

Were I to follow my own inclinations I would ask that a larger sum be set aside to be drawn upon for materially enlarging the scope of the library by the purchase of books; but I prefer to wait until others appreciate its advantages sufficiently to make a voluntary effort on their own part.

Respectfully submitted,

WM. LEE.

2111 PENNSYLVANIA AVENUE, WASHINGTON, D. C.

CATALOGUE OF THE LIBRARY.

Catalogue of Additions by Donations, Exchanges, and Purchase to the Library of the American Medical Association from April 1, 1879, *to May* 1, 1880.

Abercrombie (Joseph)—

Pathological and Practical Researches on Diseases of the Stomach, the Intestinal Canal, the Liver, and other Viscera of the Abdomen. Second American, from the second London edition, enlarged. Philadelphia, 1834. 8vo. 374 pp. Donor, Dr. E. C. Bright, Eminence, Ky.

Agriculture—

Annual Report of the U. S. Commissioner for 1878. Washington, Government Printing Office, 1879. 8vo. Donors, Commissioners.

Ambulances—

Report of a Board of Officers to decide upon a Pattern of an Ambulance Wagon for army use. Washington, Government Printing Office, 1878. 8vo. 79 pp. 9 illustrations. Donor, Dr. S. J. Radcliffe.

Armstrong (John)—

Lectures on the Morbid Anatomy, Nature, and Treatment of Acute and Chronic Diseases, edited by Joseph Rix. First American edition, with an account of the life and writings of Dr. Armstrong, by John Behr. In two volumes. Philadelphia, 1837. 8vo. Vol. I. Donor, E. C. Bright, Eminence, Ky.

Practical Illustrations of Typhus and other Fevers: of Pulmonary Consumption, Measles, etc. etc. From the last London edition, with notes by P. Washington Leland. Boston, 1829. 8vo. 559 pp. Donor, Dr. E. C. Bright, Eminence, Ky.

Army (United States. *Medical* Department)—

Statistical Report on the Sickness and Mortality in the Army of the United States, compiled from the records of the Surgeon-General's Office; embracing a period of five years, from January, 1855, to January, 1860. Prepared under the direction of Brevet Brigadier-General Thomas Lawson, Surgeon-General U. S. Army, by Richard H. Coolidge. Washington, 1860. 4to. 515 pp. (36th Congress, 1st session, Senate Executive Document, No. 52.) Donor, D. N. Porter, Eminence, Ky.

The Medical and Surgical History of the War of the Rebellion. Part 2. Vol. I. Medical History. 4to. xii. 869 pp., illustrated. Exchange.

Arnott (Neil)—

Elements of Physics, or Natural Philosophy, General and Medical, explained independently of technical mathematics. In two volumes.

Vol. II. Part 1, comprehending the subjects of Heat and Light. First American, from the first London edition. Philadelphia, 1831. 8vo. 232 pp., illustrated.

Arnott (Neil)—

Elements of Physics, or Natural Philosophy, General and Medical, explained independently of Technical Mathematics, and containing new disquisitions and practical suggestions. First American, from the third London edition. With additions by Isaac Hays. Philadelphia, 1829. 8vo. 532 pp. illustrated. Donor, Dr. E. C. Bright, Eminence, Ky.

Baezer (Adolf)—

Ueber die Chemische Synthese. Festrede zur Vorfeier des Allenhöchsten Geburts- und Namensfestes Seiner Majestät Ludwig II. Königs von Bazern, gehalten in der öffentischen Sitzung der k. b. Akademie Wissenschaften München am 25 Juli, 1878. 4to. 22 pp. Exchange.

Balfour (William)—

Observations with Cases Illustrative of the Sedative and Febrifuge Powers of Emetic Tartar. Edinburgh, 1818. 8vo. 92 pp. Donor, Dr. G. S. Franklin, Chillicothe, Ohio.

Bell (Charles)—

Observations on Injuries of the Spine and of the Thigh Bone, in two lectures delivered in the school of Great Windmill Street. The first is indicative of the author's opinions against the remarks of Sir Astley Cooper, Bart. The second on the late Mr. John Bell's title to certain doctrines now advanced by the same gentleman. Illustrated with 9 plates. London, 1824. 4to. xv. 96 pp. Donor, Chas. E. Lining, Evansville, Ind.

Engravings of the Bones, Muscles, and Joints. Part First, containing engravings of the Bones. The first American, from the second London edition. Philadelphia, 1816. 4to. pp. 408. Part Second, containing engravings of the Muscles and of the Joints. The first American edition, from the second London edition. Philadelphia, 1815. 4to. 123 pp. Donor, Dr. Chas. E. Lining, Evansville, Indiana.

Bell (John). *Stokes* (William)—

Lectures on the Theory and Practice of Physic. Third edition, enlarged and improved. In two volumes. Vol. I. Philadelphia, 1845. 8vo. Donor, Dr. E. C. Bright, Eminence, Ky.

Bennet (James Henry)—

A Practical Treatise on Inflammation, Ulceration, and Induration of the Neck of the Uterus; with Remarks on the Value of Leucorrhœa and Prolapsus Uteri as Symptoms of Uterine Disease. Philadelphia, 1847. 12mo. 146 pp. Donor, Dr. E. C. Bright, Eminence, Ky.

Biographies—

Cook (John L.). Memorial Address on the Life, Character, and Death of. Henderson, Ky. By J. W. Singleton, Paducah, Ky. Read before the McDowell Medical Society at Hopkinsville, Ky., October 30, 1878. Reprinted from the American Practitioner, March, 1879. Indianapolis, 1879. 8vo. 12 pp. Donor, Author.

Borck (Edward)—

Reflections upon the History and Progress of the Surgical Treatment of Wounds and Inflammations. A Report on the Progress of Surgery. Read before the Missouri State Medical Association at Columbia, Mo., June, 1879 (reprinted from the Transactions), St. Louis, 1880. 8vo. 11 pp. Donor, Author.

Brodie (Benjamin C.)—

Lectures on the Diseases of the Urinary Organs. From the third London edition, with alterations and additions. Philadelphia, 1843. 8vo. 214 pp. Donor, Dr. G. S. Franklin, Chillicothe, Ohio.

Buckler (T. H.)—

Notes on the Anatomical Relations of Uterine Structures, with Surgical Remarks and Therapeutical Suggestions. (Reprinted from the Boston Medical and Surgical Journal), Cambridge, 1880.) 12mo. 34 pp. Donor, Author.

Bulkley (S. Duncan)—

On the Nomenclature and Classification of Diseases of the Skin ; with Remarks upon that recently adopted by the American Dermatological Association. (Reprinted from Archives of Dermatology, April, 1879.) 8vo. 15 pp.

On the Use of Water in the Treatment of Diseases of the Skin. (Reprinted from the Chicago Medical Journal and Examiner for January, 1880.) New York, 1880. 8vo. 13 pp.

New Method of Permanently Removing Superfluous Hairs. Reprinted from the "Archives of Dermatology," October, 1878. New York, 1878. 8vo. 7 pp. Donor, Author.

Burns (John)—

The Principles of Midwifery (title-page wanting; preface to second edition). Glasgow, July, 1811. Edited by Thos. C. James, with Preface. Philadelphia, September, 1813. 2 vols. 8vo. Donor, Dr. D. N. Porter, Eminence, Ky.

Busey (Samuel C.)—

Alternating Anterior and Posterior Version of the Uterus. Reprint from Volume III. Gynecological Transactions, 1879. 8vo. 12 pp.

Thrombosis of the Sinuses of the Dura Mater in Fatal Cases of Dysentery in Young Children. Reprinted from the American Journal of Obstetrics and Diseases of Women and Children, Vol. XIII., No. 1, January, 1880. New York, 1880. 8vo. 8 pp. Donor, Author.

Bush (L. P.)—

Some Vital Statistics of the City of Wilmington. Read before the Delaware State Medical Society June, 1877. Wilmington, 1877. 8vo. 12 pp. Donor, Author.

Cadet (Socrate)—

Esempi comprovanti l'uso interno del sottosolfato di meraino ed esempi concorrenti a comprovare l'efficacia antilimica del solfuro nerodi esso. Lettera al Directore della Corrispondenza Scientifica di Roma. Sig. Erasmo Fabri Scarpellini. Roma, 1875. 8vo. 8 pp.

Intorno la cura preservativa del morbo bilarzico e del trichinoso e di nuovo intorno la cura dei morbo pestilenziali all' eremo e chiarmo Sig. Doto. Alessandro Bellotti Bey. Lettera Estratta dal Bollettino della Corrispondenza Scientifica in Roma dell' anno xxviii., No. 29. Roma, 1876. 8vo. 7 pp.

Cheselden (William)—

The Anatomy of the Human Body, with forty copperplates. Second American Edition. Boston, Jan. 1806. 8vo. 352 pp. Donor, Dr. E. C. Bright, Eminence, Ky.

Cheyne (John)—

An Essay on the Bowel Complaints of Children, more immediately connected with the Biliary Secretion, and particularly of Atrophia Ablactatorium or Weaning Brash. Philadelphia, 1813. 12mo. 111 pp. Donor, Dr. G. S. Franklin, Chillicothe, Ohio.

An Essay on Cynanche Trachealis. Philadelphia, 1813. 12mo. 110 pp. Donor, do.

Chisolm (Julian J.)—

Neurotomy: a Substitute for Enucleation in Ophthalmic Surgery. Reprint from Va. Med. Monthly, November, 1879. Richmond, 1879. 8vo. 16 pp. Donor, Author.

Cholera.

Cholera-Kommission (Der) für das Deutsche Reich-Berichte Sechstes Heft, mit Atlas. 1879. 4to. 342 pp. Donor, Dr. Aug. Hirsch, Berlin, Germany.

Clark (James)—

A Treatise on Pulmonary Consumption; comprehending an inquiry into the causes, nature, prevention, and treatment of tuberculous and scrofulous diseases in general. Philadelphia, 1835. 8vo. 296 pp. Donor, Dr. E. C. Bright, Eminence, Ky.

Colleges—Annual Announcements, Circulars, etc.

California—

Medical College of the Pacific (late Medical Department of the University of the Pacific): being the Medical Department of University (City) College, San Francisco. Annual Announcement for 1880. Donor, College.

Toland Hall. Medical Department of the University of California, San Francisco. Annual Announcements, 11th, 12th, 15th, and 16th. Donor, College.

District of Columbia—

National College of Pharmacy. Eighth Annual Circular. Donor, W. G. Duckett.

National Medical College of the Columbian University. 58th Annual Circular. Addresses delivered at the 58th Annual Commencement. Donor, College.

Nurse's (The) Training School of Washington, D. C., Second Session, 1879–80.

Kentucky—

Louisville College of Pharmacy. Ninth Annual Circular. Donor, College.

Maryland—

Johns Hopkins University. Studies from the Biological Laboratory; Session 1878–79. Edited by H. Newell Martin. No. 11. Baltimore, 1880. 8vo. 125 pp., illustrated. Donor, Editor.

Maryland University, Baltimore. 72d Annual Circular. Donor, College.

Massachusetts—

Boston (The) Dental College. Annual Catalogue for 1879–80. Donor, College.

School for Deaf Mutes, Boston, for 1873. Donor, Bureau of Education.

Harvard University Medical School Catalogue for 1879–80. Donor, College.

New York—

American Veterinary College, New York City. Catalogue for 1878-9. Donor, College.

Bellevue Hospital Medical College, New York City. Annual Circular for 1879-80. Donor, College.

College of Physicians and Surgeons of the City of New York. 72d Annual Announcement. Donor, College.

Columbia Veterinary College and School of Comparative Medicine. Annual Catalogue for 1879. Donor, College.

University of the City of New York, Medical Department. Annual Announcement for 1879-80. Donor, College.

Ohio.—

Cincinnati College of Medicine and Surgery. 45th Annual Announcement.

Cincinnati College of Pharmacy. 9th Annual Announcement. Donor, College.

Medical College of Ohio. 59th Annual Catalogue. Donor, College.

Miami Medical College. 20th Annual Announcement. Donor, College.

Cleveland—University of Wooster Medical Department. 16th Annual Catalogue.

Columbus—*Starling* Medical College. 33d Annual Announcement. Donor, College.

Pennsylvania—

Jefferson Medical College, Philadelphia. 55th Announcement. Donor, College.

University of Pennsylvania, Medical Department. 114th Annual Circular, 2d Edition. Donor, College.

Woman's (The) Medical College. Catalogue for 1879-80. Donor, College.

Tennessee—

Nashville Medical College: now the Medical Department of the University of Tennessee. 5th Annual Catalogue. Donor, College.

Vermont—

University of Vermont, Medical Department. 27th Annual Catalogue. Donor, College.

Comstock (J. S.)—

Elements of Mineralogy, adapted to the use of Seminaries and Private Students. Boston, 1827. 8vo., lxxvi., 339 pp. Donor, Dr. E. C. Bright, Eminence, Ky.

Cooke (John Esten)—

A Treatise of Pathology and Therapeutics. In three volumes. Lexington, Kentucky, 1828. 8vo. Vols. I. II. Donor, Dr. E. C. Bright, Eminence, Ky.

Cooper (Astley)—

Lectures on the Principles and Practice of Surgery, with additional Notes and Cases by Frederick Tyrrell. Fifth American, from the last London edition. Complete in one volume. Philadelphia, 1839. 8vo. 580 pp., four Plates. Donor, Dr. E. C. Bright, Eminence, Ky.

Cooper (Thomas)—

Medical Jurisprudence, including Farr's Elements of Medical Jurisprudence, Dease's Remarks on Medical Jurisprudence, Males' Epitome of Juridical

or Forensic Medicine, and Haslam's Treatise on Insanity; with an appendix containing Erskine's speech for James Hadfield, indicted for shooting at the king; an abstract of a report of the trial of Abraham Kessler. indicted for poisoning his wife with white arsenic and laudanum, and a memoir on the chromate of potash, as a test for detecting arsenic, copper, and corrosive sublimate. 8vo. 456 pp., n. d. n. p., several pages missing. (Philadelphia, 1819?) Donor, Dr. E. C. Bright, Eminence, Ky.

Copeland (Thomas)—

Observation on some of the Principal Diseases of the Rectum and Anus; particularly Stricture of the Rectum, the Hæmorrhoidal Excrescence, and the Fistula in Ano. Philadelphia, 1811. 12mo. 120 pp. Donor, Dr. G. S. Franklin, Chillicothe, Ohio.

Cullen (William)—

First Lines of the Practice of Physic, in two volumes, with Practical and Explanatory Notes, by John Rotherman. Vols. I. II. Philadelphia, 1792. 8vo. Donor, Dr. E. C. Bright, Eminence, Ky.

Cutter (Ephraim)—

Salisbury's New Physical Sign of Syphilis. American Journal of Dental Science, 1879. 8vo. 12 pp.

Primer of the Clinical Microscope. Boston Optical Works, 1879. 8vo. 26 pp. illustrated. Donor, Author.

Dana (J. Freeman) and (Samuel S.)—

Outlines of the Mineralogy and Geology of Boston and its Vicinity, with a Geological Map. Boston, 1818. 8vo. 108 pp. (Map missing.) Donor, Dr. E. C. Bright, Eminence, Ky.

Davenport (M.)—

Humbuggiana: a Poem. Nashville, 1842. 8vo. 99 pp. Donor, Dr. G. S. Franklin, Chillicothe, Ohio.

Dewees (William P.)—

A Treatise on Diseases of Females. Seventh edition, revised and corrected. Philadelphia, 1840. 591 pp., 12 plates. Donor, Dr. E. C. Bright, Eminence, Ky.

Directories—

Iowa. Medical (The) and Surgical Directory of the State of Iowa for 1878 and 1879, etc. etc., by Charles H. Lothrop, Clinton, Iowa, 1878. 8vo. 154 pp. Donor, Author.

Dispensatories—

Eclectic (The) and General Dispensatory; comprehending a System of Pharmacy, Materia Medica, the Formulæ of the London, Edinburgh, and Dublin Pharmacopœias, prescriptions of many eminent physicians, and receipts for the most common empirical medicines; collated from the best authorities by an American physician. Philadelphia, 1827, 8vo. 627 pp., 7 plates. Donor, Dr. E. C. Bright, Eminence, Ky.

Drake (Daniel)—

Essays on Medical Education and the Medical Profession, n. d. n. p. 8vo. 104 pp. (Cincinnati, 1832?) Donor, Dr. E. C. Bright, Eminence, Ky.

Druitt (Robert)—

The Principles and Practice of Modern Surgery. A new American, from the last and improved London edition, edited by F. W. Sargent, illus-

trated with one hundred and ninety-three wood engravings. Philadelphia, 1850. 8vo. 576 pp. Donor, Dr. D. N. Porter, Eminence, Ky.

Ducamp (Theodore)—

A Treatise on the Retention of Urine, caused by Strictures in the Urethra; and of the means by which obstructions of this canal may be effectually removed. Translated from the French, with notes and additions, by William M. Herbert, New York, 1827. 8vo. ix. 209 pp., 5 plates. Donor, Dr. G. S. Franklin, Chillicothe, Ohio.

Dunster (Edward S.)—

An Argument made before the American Medical Association at Atlanta, Ga., May 7, 1879, against the proposed amendment to the Code of Ethics restricting the teaching of students of irregular or exclusive systems of medicine. (Reprinted from the Physician and Surgeon, June, 1879.) Ann Arbor, Michigan, 1879. 8vo. 28 pp. Donor, Author.

Earle (Chas. Warrington)—

The demand for a Woman's Medical College in the West. An address delivered at the commencement of the seventh annual course of lectures and dedication of the Woman's Medical College, Chicago, Illinois. Waukegan, Illinois, 1879. 8vo. 13 pp. Donor, Author.

The Cinchona Cure for Intemperance. Reprint from the Chicago Medical Journal and Examiner, February, 1880. Chicago, 1880. 8vo. 19 pp. Donor, Author.

Earle (Pliny)—

A Glance at Insanity, and the Management of the Insane in the American States. Read before the Conference of Charities, held at Chicago, Ill., June 10, 1879. Boston, 1879. 8vo. 19 pp. Donor, Author.

Eberle (John)—

A Treatise on the Diseases and Physical Education of Children, Cincinnati, 1833. 8vo. 559 pp. Donor, Dr. E. C. Bright, Eminence, Ky.

Education—

Report of the Commissioner of Education for the year 1877. Washington, Government Printing Office, 1879.

Circulars of Information of the U. S. Bureau of Education.

No. 2, 1878, Elementary Education in London. 8vo. 24 pp.

No. 1, 1879, Training Schools for Nurses. 8vo. 21 pp.

No. 5, 1879, American Education as described by the French Commission to the International Exhibition of 1876. 8vo. 37 pp. Exchange.

Engineer Department, U. S. Army—

Report of the Chief of Engineers for the year 1878. Washington, Government Printing Office, 1878. 3 vols. 8vo.

Reports upon the Specimens, obtained from Borings made in 1874, between the Mississippi River and Lake Borgne, at the site proposed for an outlet for flood waters, by Prof. Eugene W. Hilgard and Dr. F. V. Hopkins, 1878. 8vo. 49 pp., illustrated.

On the Use of the Barometer on Surveys and Reconnoissances; being a compendium, without plates, of No. 15 of the professional papers of the corps of engineers, by Lieut.-Col. Williamson, 1878. 8vo. 49 pp.

Report on the Mississippi River, professional papers No. 13, by Humphreys and Abbott, 1861. Reprinted, with additions, 1876. 4to. 691 pp., 25 plates and maps.

Reply to Criticisms (on the same) made by Dr. Hagen, Director-General of Public Works, Prussia, do. New York, January, 1878. 8vo. 8 pp.

On the Use of the Barometer on Surveys and Reconnoissances, professional papers No. 15. Part I. Meteorology in its connection with Hypsometry. Part II. Barometric Hypsometry by R. S. Williamson, New York, 1868. 4to. 248 pp., 31 plates.

—— Appendix. Practical Tables in Meteorology and Hypsometry, New York, 1868. 4to. 155 pp. Donor, Engineer Department.

Engelman (George S.)—

The Difficulties and Dangers of Battey's Operation. Extracted from the Transactions of the American Medical Association, Philadelphia, 1878. 8vo. 13 pp. Donor, Author.

Esmarch (Frederick)—

The Surgeon's Handbook on the Treatment of Wounded in War. A Prize Essay, translated by H. H. Clutton, with 536 woodcuts and 30 colored plates, Hanover, 1878. 8vo. xv. 515 pp. Donor, Author.

Evans (Thomas W.)—

Report on Instruments and Apparatus of Medicine, Surgery, and Hygiene; surgical dentistry, and the materials which it employs; anatomical preparations; ambulance tents and carriages, and military sanitary institutions in Europe. Paris Universal Exhibition, 1867. Reports of the United States Commissioners. Washington, Government Printing Office, 1868. 8vo. 70 pp. Donor, Dr. S. J. Radcliffe.

Explorations and Surveys—

Reports of, to ascertain the most practicable and economical route for a railroad from the Mississippi River to the Pacific Ocean. Vol. II. Washington, 1857. 4to. Donor, Dr. D. N. Porter, Eminence, Ky.

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Medical Times and Gazette, No. 1300. Donor, Dr. S. J. Radcliffe, Washington, D. C.

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Gazetta Medica Italiana Provincie Venete. Diretta e compilata F. Coletti e Antonio Barbo Soncin. Padua. Publica agni Sabbato. Anno 21, Nos. 11, 13 to 52; anno 23, Nos. 1 to 14. Exchange.

Mexico. Nienda de Yucatan.

La Emulacion. Periodico de la Sociedad Medico-Farmaceutica. Tome III. Nos. 5, 12. Exchange.

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Gazette Medicale D'Orient. Publiée par Société Imperiale de Médecine de Constantinople. Parait 1^er^ de chaque mois. XXII^ma^ annee, Nos. 1 to 10. Exchange.

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Escuela Medica. Revista Juricenal de Cuncias Medicas, Fisicase Historia Natural (Organo de la Sociedad "Escuela Medica") Administrador: Dr. Adolfo Frydensberg Hijo. Caracas, Segunda Epoca. Ano 1, No. 9. Exchange.

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American (The) Medical Bi-Weekly. Louisville, Kentucky. E. S. Gaillard, Editor. Vol. X. Nos. 8 to 13; Vol. XI. Nos. 1 to 8. Exchange.

American (The) Medical Journal (Eclectic). Edited by Geo. C. Pitzer. St. Louis. Vol. VII. No. 10.

American (The) Monthly Microscopical Journal. Editor and Publisher, Romeyn Hitchcock. New York. Vol. I. to II. (February, 1880.)

American (The) Practitioner. A Monthly Journal of Medicine and Surgery. Edited by David W. Yandell and Theophilus Parvin. Louisville. Nos. 112 to 120. Exchange.

American Veterinary Review. A. Liautard, Editor. Published by the United States Veterinary Association. New York. Vol. III., IV. No. 1. Exchange.

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Medical and Chirurgical Faculty. Transactions, 1879. Exchange.

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Gynecological Society of Boston. The journal of the, devoted to the advancement of the knowledge of the diseases of women. Edited by Winslow Lewis, Horatio R. Storer, and Geo. H. Bixby. Vol. I. Nos. 1, 2, 3; Vol. III. No. 6. Donor, Dr. J. Z. Gerhard, Harrisburg, Pa

Medical Society. Medical Communications. 2d Series, Vol. VIII. Part V. Exchange.

Minnesota—

State Medical Society. Transactions, 1879. Exchange.

Missouri—

Medical Association of the State. Transactions, 22d. Exchange.

New Hampshire—

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New York—

Brooklyn—

Anatomical (The) and Surgical Society. Annals of the, Vols. I. (1878-9); II. No. 1. Exchange.

Medical Society of the County of Kings. Proceedings, Medical and Scientific Papers, Reports, Discussions, and Notes. Published monthly in the interest of the profession in Kings County. Conducted by the Council of the Society. Vol. IV. Nos. 3 to 12; Vol. V. Nos. 1, 2. Exchange.

New York State Medical Society Transactions, 1807-1831 (1 vol.); 1840-43 (1 vol.); 1857, 1860, 1861, 1862, 1864, 1865, 1871, 1873-4, 1875 to 1879 (5 vols.). Exchange.

North Carolina—

State Medical Society Transactions. 26th vol. Exchange.

Pennsylvania—

Pharmaceutical Association. Proceedings for 1878-79, with the Constitution, By-laws, and a list of members. Harrisburg, Pa., 1879. 8vo. 64 pp. Donor, Association.

Adams County Medical Society, Report of the, by J. W. C. O'Neal. Extracted from the Transactions of the Medical Society of the State of Pennsylvania for 1879. Philadelphia, 1879. 8vo. 19 pp. Donor, Reporter.

Pennsylvania State Medical Society. Transactions, 4th series. Vol. XII. Part II. Donor, Society.

Rhode Island—

Medical Society. Transactions for 1878-9. Exchange.

South Carolina—

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Tennessee—

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Wisconsin—

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Stevenson (John)—

On the Morbid Sensibility of the Eye, commonly called weakness of sight. Hartford, 1815. 12mo. 99 pp. Donor, Dr. G. S. Franklin, Chillicothe, O.

Teale (Thomas Pridgin)—

A Treatise on Neuralgic Diseases, dependent upon irritation of the Spinal Marrow and Ganglia of the Sympathetic Nerve. Concord, n. d. 16mo. 120 pp. Donor, Dr. G. S. Franklin, Chillicothe, Ohio.

Thomson (Thomas)—

A System of Chemistry, in four volumes. From the fifth London edition,

with notes, by Thomas Cooper. Philadelphia, 1818. Vols. I., II., III., IV. 8vo. Donor, Dr. E. C. Bright, Eminence, Ky.

Van Bibber (John)—

The Future Influence of the Johns Hopkins Hospital on the Medical Profession of Baltimore. Baltimore, 1879. 8vo. 22 pp. Donor, Author.

Vaugnion (M. de la)—

A Compleat Body of Chirurgical Operations, containing the whole Practice of Surgery, with observations and remarks on each case; amongst which are inserted the several ways of delivering women in natural and unnatural labours. The whole illustrated with copperplates, explaining the several bandages, sutures, and divers useful instruments. Faithfully done into English. London, 1699. 12mo. 480 pp., 12 plates. Donor, Dr. Wm. H. Sharp, Chillicothe, Ohio.

Waters (Mineral)—

The Buffalo Lithia Waters of Mecklenburg Co., Va., as a Remedial Agent in Affections Peculiar to Women. Testimony exclusively of well-known medical men. Baltimore, 1879. 8vo. 16 pp.

Capon Springs and Baths, Hampshire County, W. Va. (circular of). Baltimore, 1879. 8vo. 16 pp.

Williams (Charles J. B.)—

A Rational Exposition of the Physical Signs of the Diseases of the Lungs and Pleura; illustrating their pathology, and facilitating their diagnosis, with plates. Second American, from the last London edition. Philadelphia, 1834. 8vo. 205 pp. Donor, Dr. E. C. Bright, Eminence, Ky.

Willis (Robert)—

Urinary Diseases and their Treatment. Philadelphia, 1839. 8vo. 232 pp. Donor, Dr. G. S. Franklin, Chillicothe, Ohio.

Wilson (Henry P. C)—

The Hand as a Curette in Post-partum Hemorrhage. Reprint from Vol. III. Gynecological Transactions, 1879. 8vo. 5 pp. Donor, Author.

The Thermantidote, an instrument for preventing the evil effects of heat from Paquelin's thermo-cautery, when operating in deep cavities. Reprint from Transactions of Medical and Chirurgical Faculty of Maryland. Baltimore, 1879. 8vo. 12 pp., illustrated. Donor, Author.

Wilson (John)—

Outlines of Naval Surgery, Edinburgh, 1846. 16mo. 13 pp. Donor, Dr. G. S. Franklin, Chillicothe, Ohio.

Winslow (James Benjamin)—

An Anatomical Exposition of the Structure of the Human Body. Translated from the French original by G. Douglas, M.D., illustrated with copperplates. The third edition corrected. London, 1749. 4to. xxiv. 334; iv. 355 pp. Donor, Dr. Chas. E. Lining, Evansville, Indiana.

Woodward (J. J.)—

On the Structure of Cancerous Tumors and the Mode in which adjacent parts are invaded. Lecture I. of the Toner Lectures instituted to encourage the discovery of new truths for the advancement of medicine, delivered March 28, 1873. Smithsonian Miscellaneous Collections. 8vo. 40 pp., 74 figures. Donor, Dr. S. J. Radcliffe, Washington, D. C.

ADDRESS

OF

LEWIS A. SAYRE, M.D.,

PRESIDENT OF THE ASSOCIATION.

ADDRESS OF LEWIS A. SAYRE, M.D.,

PRESIDENT OF THE ASSOCIATION.

GENTLEMEN OF THE AMERICAN MEDICAL ASSOCIATION:—

BEFORE entering upon the duties of the high office to which you have elected me, I wish to return you my sincere thanks for the distinguished honor thus conferred, and to pledge you that I will endeavor to discharge its duties to the best of my ability.

No one can feel more keenly than I do my own incapacity properly to fill the distinguished position to which you have elected me, or more sincerely regret that some other, more competent and more worthy of the honor, had not been elected in my place. But as your too partial personal friendship has thus elevated me to this post, I must appeal to your generosity to overlook any of my shortcomings, and rely upon your mutual aid to assist me in the discharge of the important duties thus imposed.

Who can properly appreciate the value of this Association, or the immense advantage it has already been to the medical profession throughout our whole country? Contemplate for a moment the difference in the *morale*, the devotion to scientific investigation, the mutual respect and good feeling between its members at the present time, and the condition when this Association was organized. At that time there were often envyings, jealousies, and heart-burning, fault-finding, and traduction; those who had achieved distinction were frequently slandered and abused by those who had not been so fortunate; the slightest imperfection of a professional brother was magnified into such undue proportions as completely to obscure any really good qualities or attainments that he might actually possess; and thus the whole profession was injured in the estimation of the public by the rivalries, bickerings, and jealousies that existed among its members. Now, each one seems so engaged in endeavoring to improve himself and elevate his own position in

the profession, that he has no time to devote to studying his neighbor's faults, much less to accurately scrutinize and publicly herald his seeming defects.

The science of medicine has been so much enlarged in all its different departments by the minute researches now demanded, and by the great advance and rapid progress of many of its specialties, as to require that every moment of a man's time be occupied in the closest study if he would keep himself abreast with the daily improvements in our profession. And he who is thus occupied has no time to study the defects of others. By this constant struggle to improve ourselves and advance our science, the whole profession becomes more elevated in tone; and we already see that physicians are becoming more and more respected by the community at large.

Let us contemplate for a few moments what has been done by the profession in America for the improvement of medical and surgical science, and the relief of suffering humanity. Some years ago, Sydney Smith, one of England's most popular authors, said in the Edinburgh *Review:* "The Americans are a brave, industrious, and acute people, but they have hitherto made no approaches to the heroic, either in their morality or their character. During the thirty or forty years of their independence they have done absolutely nothing for the sciences, for the arts, for literature, or even for the statesmanlike studies of politics and political economy. . . . In the four quarters of the globe, who reads an American book, or goes to an American play, or looks upon an American picture or statue? What does the world yet owe to American physicians or surgeons? What new substances have their chemists discovered, or what old ones have they analyzed? What new constellations have been discovered by the telescopes of Americans? What have they done in mathematics? Who drinks out of American glasses, or eats out of American plates, or wears American coats or gowns, or sleeps in American blankets?"

It would seem to me that the very Declaration of Independence, and the willingness to sacrifice their lives to obtain it, was an act of heroism equal to any recorded in history. And the organization of the Government under constitutional law, which has yielded such results as were never before obtained, is an evidence of statesmanship and of knowledge in political economy which has been seldom equalled, and never surpassed.

As to the questions of American manufactures and the nations that use them, we can safely refer to the reports of our Chamber of Commerce for a satisfactory answer. American science has no need to be ashamed of its Henry and its Morse, its Bache, Peirce, Newcomb, Draper, Marsh, Dana, Gray, Hall, and its adopted Agassiz. Nor has the American Journal of Science anything to fear by comparison with its European contemporaries.

But to the question, "What does the world yet owe to American physicians and surgeons?" we would venture a more full reply, although time will not permit us to revert to more than a few of our professional achievements.

First among the greatest boons ever conferred upon suffering humanity stands "anæsthesia," an American suggestion, and one that immortalizes the name of Morton. Who can ever estimate the value of this discovery, or who can accurately describe the contrast between the former agony necessarily endured in many surgical operations, and the present absolute oblivion of all pain, the happy, tranquil, undisturbed sleep while the flesh quivers under the knife? When we contemplate the millions of human beings on the earth, and consider the fact that at every moment of time, in some part of the civilized world, hundreds, if not thousands, are receiving the benefits of this great discovery, the mind becomes overawed at the magnitude of the blessing, and even imagination fails to comprehend fully its benefits.

Ovariotomy, another American contribution to the medical profession, has done probably as much toward saving life as any other surgical discovery in the nineteenth century. It was first practised, in 1809, on Mrs. Crawford, in Danville, Kentucky, by Dr. Ephraim McDowell. Although honestly and modestly reported, eight years afterward, in the *Philadelphia Eclectic Repertory and Analytical Review*, it still made no impression on the professional mind, but was received rather with derision and scorn until Dr. Atlee, in 1844, revived the operation, and by persevering effort, in spite of all opposition and the very general condemnation of his contemporaries, was enabled at last by his numerous brilliant successes to establish the operation on a permanent basis. At the present time it is acknowledged as the proper operation to perform, in certain cases, by every medical school in the civilized world. Dr. Peaslee says

that "in the United States and Great Britain alone, ovariotomy has, within the last thirty years, directly contributed more than thirty thousand years of active life to woman, all of which would have been lost, had ovariotomy never been performed."

In Gynæcology, the whole professional world cheerfully and gratefully acknowledges the original and invaluable contributions of Sims, Thomas, Emmet, Peaslee, Atlee, Kimball, Taylor, Pallen, Dunlap, Minor, and others in this department.

The new operation of Litholopaxy, which consists in the prompt and entire fragmentation of calculous material in the bladder, and the entire removal of the debris by aspiration through a tube passed by the urethra at a single sitting, first performed and described by Dr. Bigelow of Boston, is one of the grandest triumphs of modern surgery, and of which any American surgeon may well feel justly proud.

In conservative Surgery, we certainly compare most favourably with any other nation. In the mechanical treatment of diseases of the joints, by which means the patients are able to take free exercise in the open air during the whole progress of the disease, thus acquiring power to overcome the constitutional dyscrasia better than by any means heretofore employed, and, when the disease has progressed beyond repair, then to perform the sub-periosteal exsection of the joint in such a manner as to leave the muscular attachments in their normal position, and by judicious after-treatment to restore them with but slight deformity and almost perfect power of motion,—these certainly are triumphs in surgery, of which the American profession may well be proud.

In the *Lancet*, of February 14, 1880, Roderick Maclaren, M.D., Surgeon to the Cumberland Infirmary, in his Presidential address to one of the branches of the British Medical Association, on "The Advances of Surgery during the past twenty years," says: "No account of the recent progress in Surgery can justly omit the application of the principles of absolute rest to diseases of the vertebræ. It is done by inclosing the body in a plaster-of-Paris jacket. Though only introduced into this country about two years ago, it has established itself as an *incontrovertible success.*" This is another triumph for American Surgery, and is justly admitted not only in England, but in all parts of the civilized world.

When we contemplate the misery and suffering of the un-

fortunate "hump-back," who, after years of torturing treatment, has for its termination only deformity or death; or, the patient with a bad lateral curvature, who, in addition to deformity, has for years suffered constant agony from the application of the cruel instruments of torture, intended for his relief but never successful, and compare his condition with that resulting from the present mode of treatment, which is void of all danger, perfectly painless in its application, allowing the freest exercise and enjoyment during its progress, always affording immediate relief even in cases that have passed beyond the hope of cure, —and in the majority of cases, when the treatment has been commenced at a proper time and judiciously carried out, terminating in a perfect result—frequently leaving no trace of deformity as an evidence of its previous existence,—we feel that American Surgery has a right to congratulate herself that she has contributed this great boon for the relief of human suffering.

In Laryngology, we can certainly claim Green as a pioneer, and we all know the censure he received, and the opposition he encountered: but the facts he then established are now acknowledged by the entire scientific world—and the improvements made in this department of Surgery by Cohen, Cutter, Bosworth, Elsberg, Lincoln, Lefferts, Robinson, and many others in this country, entitle us to rank with other nations.

Time will not permit us to refer to all our contributions in the different departments of medical and surgical science; but I have enumerated enough to justify the belief that if the distinguished author before referred to was now to write, he would express very different sentiments from those above quoted. Not content, however, with what we have already achieved, let us still press onward, and, accepting the motto of our great State, constantly cry "Excelsior."

METRIC SYSTEM.

It is the duty of this Association carefully to investigate every claim to improvement or advance in medical and surgical science; and, if such claim is found to be worthy of confidence, to lend such innovation or improvement the moral influence of its support.

One of these innovations is the substitution of the "Metric System of Weights and Measures" for our present uncertain

"formula." As medical science is not sectional, or even national, but universal, we certainly should adopt some nomenclature and modes of expression for weight, measure, and form, that would be the same in all languages, and among all nations of the civilized world. This is what the metric system proposes, and it seems to me that this Association should immediately recommend its adoption.

At the meeting of this Association in Buffalo, June 5, 1878, the following resolution was passed by the Section on Practice of Medicine, Materia Medica, and Physiology:—

"*Resolved*, That this Section, recognizing the value of the metric system for its uniform, international, indestructible, generally applicable, convenient, simple, safe, and scientific character, hereby recommends to all physicians the use of the same in their practice, and in their writings and teachings."

The passage of a resolution, even by unanimous vote, does not always imply that those who have favored it will take active measures to have it carried out in practice. There are few, if any, who make themselves practically familiar with the metric system without perceiving its great superiority to all other systems of weights and measures already in use. But no system, however perfect in theory, can become practically of much value until it has become so well known to the public that little or no special instruction is needed by those who are intrusted with its application. The present objectionable methods of dispensing medicine have the great advantage of prestige of habit. To overthrow this, and to secure for the metric system the mere opportunity to become generally known, will require persistent effort on the part of its friends, aside from such concert of action as may be implied in the passage of resolutions.

To enter into a detailed discussion of the advantages to be gained by using the metric system, and of the difficulties to be overcome in discarding the old, would necessitate a separate paper, rather than a mere section of an address. It will be possible only to indicate very briefly some of the salient points that mark the new system, and to show what has been its success already when imposed by authority in hospital service. At the outset it may be observed that physicians are not put to the necessity of learning the entire terminology of the metric system, simple as this may be. The only unit of volume to be

remembered is the *cubic centimetre*, occupying the space of a gaming die, or of a cube whose edge is about four-tenths of an inch. The only unit of weight is a *gram*, which is the weight of one cubic centimetre of pure water at its heaviest. Its English equivalent is a little over fifteen grains. It may be interesting to trace the relation of these units to others in use among physicists; to know, for example, that the length of the centimetre is a hundredth part of a *metre*, which in turn is the forty millionth part of the earth's circumference; but practically there is little or no necessity for the measurement of length or surface in the dispensing of medicine. The various prefixes, of Latin and Greek origin, which are regarded by many as too learned in sound to be accepted in place of the more familiar, but less simple, English denominations now in use, will give no trouble to the physician, because he has no need to use them.

No one objects to either the name or the use of dollars and cents; and no one on this side of the Atlantic would be willing to give up our decimal mode of counting money for that of pounds, shillings, pence, and farthings, in which reduction from one denomination to another is a perpetual source of annoyance. By the simple change in position of a decimal point we are able, without the change of a single figure, to express the fortune of a millionaire in fractions of a cent. No one experiences any difficulty in forming an estimate, clearly and promptly, of the value expressed by a given number of dollars and decimals of a dollar; nor does any one think of reading the amount as so many eagles, dollars, dimes, cents, mills, and tenths of a mill. Though these denominations are given in the books, we have practically discarded all except dollars and cents, because these two are found sufficient for most purposes. In like manner, most of the denominations of the metric system will not be employed, because they are not wanted, and because the numerical relation between the few which remain in use is so very simple and easily remembered.

The reasoning which has been applied to the dollar in contrast with the British pound sterling, is equally applicable to the gram in contrast with the British ounce avoirdupois or ounce apothecaries'. A pound avoirdupois is made up of sixteen ounces, each of which weighs four hundred and thirty-seven and a half grains, making seven thousand grains in all. A pound apothecaries' is made up of twelve ounces, each of which

weighs four hundred and eighty grains, making five thousand seven hundred and sixty grains in all. The confusion resulting from this inconsistent use of the same name for things of different value is interminable and unnecessary. Let the use of the pound and ounce be replaced by that of the *gram*, which is perfectly definite in value. In pharmacy it is neither difficult nor confusing to express any given weight in grams and decimals of a gram, any given volume in cubic centimetres and decimals of the same. By the use of a vertical line near the right edge of the prescription paper, like that placed in an account book to separate dollars from cents, the danger of making mistakes is far less than where the arbitrary symbols of apothecaries' weight are employed. To express ounces in scruples, or drams in grains, a mental calculation is necessary, not very difficult, it is true, but still implying just so much liability to error, and a loss of time, which may be avoided by the use of the decimal notation.

For those who have not familiarized themselves with metric units, and who know what doses should be given when these are expressed in grains or fluidrachms, but would be at a loss to express the same in grams or cubic centimetres, tables of equivalents have already been printed and can easily be obtained. They have been in use for two years past in the U. S. Marine Hospital Service at Washington, where the employment of the metric system was made obligatory in the spring of 1878, by order of the Surgeon General. To this department, application was made a few weeks since, for information as to the success of the experiment, the object had in view being to place before this Association actual results rather than theoretic arguments. To the Surgeon General, Dr. John B. Hamilton, the following questions were put:—

I. Was any serious difficulty encountered by dispensing clerks in laying aside the old system and substituting the new?

II. Have mistakes in dispensing occurred with any noticeable degree of frequency in consequence of lack of skill in the management of decimal points?

III. Has any serious loss of time, or of accuracy, resulted from substitution of gravimetric for volumetric methods of dispensing liquid medicines?

IV. In case volumetric methods have been retained, have mistakes or difficulties arisen from the necessity of carrying in mind the specific gravities of the liquids measured, and allowing therefor?

V. Is there any apparent disposition on the part of dispensing clerks, or nurses, to return to the old system?

VI. Have you any suggestions to offer, based on the practical trial already given in the U. S. Marine Hospital whereby the adoption of the metric system by members of the American Medical Association, and by druggists in the country at large, may be facilitated?

The reply of the Surgeon General is so pointed, clear, and satisfactory, that no better service can be done in the cause of metric reform than by incorporating it, as a whole, in this address.

DEAR SIR:—

Referring to your letter of the 3d inst., I have to say in answer to the questions submitted:—

I. No serious difficulty has attended the adoption and exclusive use of the French decimal metric system in this service.

II. No mistakes have occurred on account of the change, so far as known to this office.

III. & IV.—Volumetric methods were retained, and as liquids have always been measured in the dispensing of medicines in this country, less inconvenience and trouble must necessarily attend the adoption of the metric system referred to if measures be retained than if gravimetric methods be exclusively employed, since the latter course would render it necessary to carry in mind the specific gravities of many liquids, and to make allowances accordingly in converting the terms of the old system into those of the new.

V. The discipline in the Marine Hospital service would prevent any opposition on the part of dispensing clerks or nurses.

VI. The suggestions I would make, based upon the experience in this service, are the following:—

In order to facilitate the general adoption of the new metric system in medicine and pharmacy, volumetric methods should be retained. On the one hand, this would save much labor, which would otherwise have to be done by prescription writers, and, on the other hand, it is fair to presume that whether liquids be prescribed in grams or in cubic centimetres, they will be dispensed quite generally by measure. The principal merit of the new system lies in the fact that, with nearly all liquids except syrups, glycerine, chloroform, and ether, the gram and the cubic centimetre will represent the same quantity practically.

The terms used to designate the units of the metric system should be anglicized as far as practicable, and the units reduced to the smallest number requisite. Prominence should be given to the "gram" and the "cubic centimetre," as being the only units with which it is necessary to be familiar. After the gram the *centigram* is the unit most applicable in medical and pharmacal gravimetry, and multiples and subdivisions of these two weight units are sufficient in my opinion. All the other prefixes used in the French system should be avoided in adopting that system for physicians and pharmacists, the "*centi*" alone being retained. The cubic centimetre seems to me to be a more suitable unit for use in medical formulæ than any subdivision of the litre.

In conclusion, it would be well if all friends of the metric system could agree to drop the fractions in the numbers which express the equivalents of the gram and the cubic centimetre in troy grains and minims, and to adopt the exceedingly simple rules for converting terms of the old system into those of the new, and *vice versa*, that have been found so useful in the practical trial given the decimal metric system in the Marine Hospital Service, the medical officers of which are now prescribing in metric terms for over twenty thousand patients annually. These rules were adopted simply as an aid in learning metric posology, and their usefulness ceases as soon as the prescriber is familiar with the expressions in metric terms of the doses of medicines, and they are probably not now used to any extent by the officers of this service.

I am, sir, very respectfully,

JOHN B. HAMILTON,
Surgeon-General, M. H. S.

PUBLICATION OF TRANSACTIONS.

For many years past there has been an almost annual complaint about the publishing of our Transactions. Sometimes it would be that publication had cost altogether too much money; at other times that they were not issued with sufficient promptness, and the volume when received was almost useless, since all the important papers or discussions in it had already appeared months before in the various medical journals of the country.

Upon considering carefully these objections, which have been increasing every year, it would really appear as if there were some just ground of complaint. And, since the matter is one of very grave importance, I would respectfully suggest that the Association give it very serious consideration, and, if deemed advisable, refer the subject to some proper committee, to report whether any plan can be suggested to bring the proceedings of the Association before the profession that would be better than the one now pursued. Certainly our present plan, besides being very expensive, does not give entire satisfaction; and it is very questionable whether the mode pursued by the British Medical Association, in establishing their own journal, would not be an immense improvement on our present method. The British Journal is the exclusive property of the Association; and by the liberal compensation of an accomplished editor, a weekly edition is issued, instead of an annual volume. Certainly this plan implies great economy; for, instead of being an expensive burden, as at present, the work of publication would in a very short time be a source of direct emolument.

The similarity of the two Associations in many respects, both in their organization and in their objects, is so great that we may possibly learn something to our advantage by carefully studying the history of the older association, and profit by her experience, and, if necessary, by her example. The importance of the subject must be my excuse for bringing to your attention many details which might possibly be regarded as superfluous.

Any one who has attended the meetings of the British Medical Association, and who is acquainted with its journal for the last ten years, may have observed that the extraordinary growth of that Association in power, wealth, influence in the profession, and influence in the State has been coincident with the development of a weekly organ of communication between the members,

the property of the Association, the Journal of the Association, and edited by a member of the profession appointed for the purpose by the council of the Association. This history, as told by these gentlemen, and as any one can confirm for himself by examining the facts, is extremely instructive in establishing at least one solid base for prosperity for any similar institution such as the American Medical Association. Briefly to summarize the facts, it may be stated that the British Medical Association was founded forty-six years ago by Sir Charles Hastings, a country physician, mainly for the purpose of advancing the professional interests of country physicians. Its growth was rapid, and in time it became British rather than provincial. The greatest men in England became annual presidents; its meetings were held in London, Edinburgh, and Oxford, and as a body it was highly respected. It soon appeared, however, that there was a comparatively narrow limit to its powers of extension. At each meeting considerable accessions of new members joined, but they soon fell off again. Then it was found necessary to convert the annual volume of Transactions into a weekly journal. It was noted that the *Provincial Transactions*, admirable as they were, formed a volume which did not appear for some months after the annual meeting; that such a volume was put upon the shelves and occasionally referred to, but rarely read through; that it did not appear until the interest of the meeting had faded away and until a good deal of the freshness had been taken off the papers by short abstracts and piecemeal reports, and that on the whole it was impossible to expect the Association to spread unless means were provided for more constant intercommunication between the members, and for the more rapid publication of their contributions to medical science and the more continuous discussion between the members of subjects of medical, social, and ethical interest in the intervals between the meetings. The publication of this journal had at once a favorable influence on the fortunes of the society. The numbers grew from 1000 to 2000, and the Society continued to make slow and steady progress, adding definitively about 30 new members a year to its total numbers. Twelve years ago, however, upon the resignation of Dr. Markham, a new editor was appointed, Mr. Ernest Hart, who was at that time co-editor of the *Lancet*, accepting the office of editor of the *British Medical Journal* on condition that he was allowed

considerably to increase the size of the *Journal* and to conduct it in a thoroughly energetic, and independent manner, in such a way as to make it worthy of being the weekly organ of a powerful Association. Under his direction the *Journal* was at once doubled in size. It was brought into a state of scientific and social activity, and made an organ of the most recent scientific and professional work, and its editorial departments conducted with vigor and literary skill. The effect upon the fortunes of the Association was magical. Five hundred new members joined that year, and for each successive year since that time, from five hundred to six hundred new members have been added to the list by the simple process of sending out throughout the country once or twice in the year copies of the *Journal* and forms of application for membership. The result has been that whereas for the thirty-six years that the Association had existed, it had only slowly crept up to about two thousand, it has, during the ten years that Mr. Ernest Hart has edited the *Journal*, risen in numbers until it now includes eight thousand members of the profession, and, according to the statements printed in the *Journal*, it circulates another fifteen hundred copies outside the profession. It gives forty pages of printed matter every week, so that the *Lancet* has felt itself called upon to enlarge the number of its pages in order to bring them up to its now formidable rival; but the *Journal*, by reason of the closeness of its type, still gives about one fourth more matter than its senior rival. The circulation of the *Journal* is now alleged to be some thousands more than that of the *Lancet*, and larger than that of any other medical paper in the world. Certainly the British Medical Association has in this way become the most powerful medical association in the world. The way in which the *Journal* has done this has been by converting all its subscribers into members of the Association, by a very simple process. When the extra numbers of the *Journal* are issued, which takes place at the beginning of every year, a circular which goes by post informs the person receiving it that the subscription of the Association, including the weekly supply, post free, of the *Journal*, of which a specimen copy has been sent by the same post, is five dollars per annum; but the subscription to the *Journal* alone to others than members of the Association is six-and-a-half dollars. Thus the *Journal* offers a bonus on membership in the British Medical Association.

From three to four hundred new members are thus added each January. Having thus created large nuclei of members in the various counties, the editor appoints a correspondent of the *Journal* in any part of the country in which no branch exists, and this correspondent presently makes it his business to arrange a local meeting of members and to form a branch of the Association. In this way, the number of branches which, when the *Journal* first took its new start under the editorship of Mr. Hart, was only ten, has risen now to twenty-seven. Branches have been formed, not only all over England, but throughout Scotland and Ireland; and new branches are being formed of members of the Association, who have emigrated to Australia and India and still desire, by the branch organization of the Association, to maintain close relationship with the profession in the mother country.

It is unnecessary to say anything in praise of the *British Medical Journal.* It has by far the largest circulation of any English medical journal, and its reputation is such as to make it independent of commendation on that subject. What is to the point is to refer to the balance-sheet, which is published every year and distributed at the annual meetings of the Association, as well as in the pages of the *Journal.* There it may be seen that the *Journal* becomes not only a powerful means of attracting new members to the Association, and of keeping them in it by maintaining their interest and connection with the Association and giving them "value for their money," but that its advertising columns contribute largely to increase the funds of the British Medical Association, bringing in an income of something like twenty-five thousand dollars a year. The total income of the British Medical Association is about seventy thousand dollars, of which twenty-five thousand are from advertisements in the paper, and the balance from subscriptions of members and sales of the *Journal.* Out of this income are defrayed the salary of the secretary—not a medical man but a business man—who acts as business manager of the *Journal* and general business secretary of the Association at a salary of twenty-five hundred dollars a year, giving his whole time to the work; also the rent of a building, centrally situated, which serves as the printing and publishing office for the *Journal*, and also as a gathering place for the committees of the Association throughout the year. There are, further, defrayed the expenses

of the various standing committees appointed for special purposes, such as, last year, "the promotion of legislation for habitual drunkards;" the standing committee for the examination of bills brought into parliament affecting medical interests, and for the promotion of clauses beneficial to medical interests or the opposing of provisions considered likely to be injurious to them; and other similar committees. There is a further payment out of funds of the Association for the promotion of researches in medicine and the collateral sciences. A thousand dollars were voted in this way to Professor Hughes Bennett and Professor Rutherford, of Edinburgh, for the expenses of their famous researches "On calomel and other agents having a reputation as promoting the flow of bile." In all, about fifteen hundred or two thousand dollars a year are voted in this way. Certain contributions are made towards expenses of the annual meeting, especially the printing expenditure, and, from time to time, special grants are made towards specially important medical objects. The editor of the *Journal* is paid about five thousand dollars a year, including payments for his editorial writing, and the sub-editors about twenty-five hundred dollars each. The literary expenses for payments to writers on the staff for editorial articles, reviews, criticisms, and the like, amount to about another five thousand dollars a year. After all expenses are paid, there remains now an annual surplus of from three thousand to five thousand dollars, which has been accumulated into a reserve fund.

If, then, we review the position of this powerful Association, we shall see that it has a formation which includes, first of all, a strong central executive; this is elective, mainly from its twenty-eight branches, who each send one delegate to the central council, generally the honorary secretary of the branch. This central council includes all past presidents, and twenty members elected at the annual meeting; and it meets once a quarter at least, or more often under special emergency. The central council is a powerful executive institution. It delegates the business conduct of the *Journal* to a "Journal and Finance Committee," which meets also once a quarter, occupies itself chiefly with passing accounts, and general questions of finance and business management, and communicates with the editor upon any subjects which may have arisen during the quarter. There are also a considerable number of standing committees,

appointed at the annual meeting, to consider special subjects, whose powers are strictly limited by the terms of reference, but who work throughout the year, and who derive their funds solely from special grants by the central executive committee. The standing "Committee on Parliamentary Bills" consists, like the Executive Council itself, of a representative of every branch and ten members appointed by the annual meeting, and is a most powerful protector of all medical interests. With this organization the Association possesses in the weekly *Journal* the means of keeping all its members in constant communication, one with another. The addresses given at the annual meeting by appointed orators in each subject, are at once printed in full in the *Journal*. Every paper read is printed in abstract, together with a report of the discussion excited by it. Thus, the Association secures for itself a full, rapid, and responsible report, which comes at once into the hands of all its members, and of all those in the profession, or out of it, who choose to subscribe to the *Journal*, week by week. Any subjects of discussion, which arise at the meeting, can be continued and are continued from week to week by communications in the *Journal*. Work arising out of the meeting is reported throughout the year in the *Journal*. The quarterly meetings of the executive committee, the proceedings of the standing committees, and of the branches, are all continuously brought to the knowledge of the members, and discussed by them in their weekly *Journal*. Fresh subjects of interest and of public moment, occurring throughout the year, are discussed, dealt with, and reopened for debate and final settlement at the annual meeting.

Not all the papers read at the annual meeting are published in full, but full discretion is given to the editor to publish or not, according to his estimate of the importance and interest of the papers to the members at large. The rule of the Association is that the interest of the individual must be subordinate to the common welfare, and although, no doubt, the discretion of the editor, in publishing in full, or in rejecting individual papers, may be often questioned by the individual, yet his action has from the first remained entirely unfettered; no instance of any abuse of that power is considered by any member to exist, and it has worked admirably for the general welfare in securing for the *Journal* the best of the papers read, and in making it understood that the *Journal* of the Association would never be allowed

to become a "waste basket" for inferior literature, but that a rigid power of selection would be exercised in respect to the publication of the full text of any papers offered for that purpose.

These details are of importance to the American Medical Association, for they include the germs of an organization peculiarly adapted to American ideas. It is essentially democratic, and entirely representative. It is dependent for its success on the intelligence, union, and good-will of the members. It is decentralizing, inasmuch as it tends to the formation or the strengthening everywhere of the local societies, which have thus throughout the year the means of making themselves heard in metropolitan centres, and of communicating with each other. Above all, it is a most successful and influential means of increasing the membership, enlarging the power, and widening the basis of the Association, and of making it a living organism during the intervals between the annual meetings. Finally, it has the great advantage of securing the largest amount of value to each and all of the members, for the smallest possible subscription. The *Journal* becomes, in fact, a co-operative enterprise in which *the profits resulting from their subscriptions go into their own pockets*, instead of those of any individual proprietor. They *own their own paper*. They are able to get the advantage of a powerful organization, and of a first class medical paper at the same annual subscription as that of a medical paper by itself, and with the surplus they find funds for a place of meeting for their committees, and for the promotion of public and scientific objects, and the creation of a reserve fund for future public uses. There seems no reason why an experiment so essentially accordant with American instincts and traditions, and one which has succeeded so well in England, should not have at least as great, if not a greater, success in America.

One point, however, that is specially worthy of note is, that the success of the *British Medical Journal* has been largely dependent upon the manner in which it has been conducted. The weekly *Journal* did little for the Association until it fell into the hands of an experienced editor, whose ability is so generally recognized that there is no need to dwell upon it, and to whom a large and unfettered responsibility is left, although he remains, of course, personally responsible to the executive of the Association for the right use of the power entrusted to him, as every

editor does to those who appoint him. It will be necessary to find for any organ which this Association may publish an editor of recognized position, whom the Association would accept as its worthy officer and representative in so responsible a post, a man of literary skill, scientific knowledge, and journalistic experience, or, at least, journalistic instincts and tact. He should be paid liberally, he should be treated with respect, and from him ought to be expected a serious determination to use the powers entrusted to him with courtesy and fairness, and with one sole object, the elevation of the standard of professional knowledge and interests, the maintenance of a high order of professional dignity and mutual courtesy. It is impossible to doubt that such a man can be found; possibly there may be many; and the question is one which appears to be well worthy of thorough examination by the council and members of this Association, because it seems tolerably certain that, if for the present bulky, tardy, little read, and unproductive volume of Transactions there could be substituted an active, vigorous weekly journal, read everywhere, and with a large income, such as would naturally come to it from its advertising sheet, there would be in such a change the earnest of a rapid and important growth in the numbers, influence, and usefulness of the American Medical Association.

MINUTES OF THE SECTION

ON

PRACTICE OF MEDICINE, MATERIA MEDICA, AND PHYSIOLOGY.

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TUESDAY, June 1, 1880.

THE Section on Practice of Medicine, Materia Medica, and Physiology met in the main hall of the building of the Young Men's Christian Association at half past 2 P. M., Dr. JOHN S. LYNCH, of Maryland, Chairman, Dr. W. C. GLASGOW, of Missouri, Secretary.

After a few preliminary remarks by Dr. LYNCH, a paper on *The Classification of Remedies* was read by Dr. WM. H. THOMSON, of New York.

Dr. ROBERTS BARTHOLOW, of Pennsylvania, spoke of the interest which the paper had given him, and expressed pleasure at some new points which had been alluded to. He saw many objections, however, to a classification of medicines by doses, as also to a classification of diseases and symptoms by medicines. He instanced opium as showing the radical difference of effect when given in small and large doses. He also spoke of drugs which, although symptom medicines, sometimes cure disease and even produce changes of structure. Digitalis will cure dilatation of the heart, and opium, when given through a length of time, will produce anæmia and change in blood corpuscles. Advances in knowledge show that the term alterative can no longer be strictly applied in its old meaning.

Dr. BARTHOLOW said he did not think that our knowledge of the action of medicines or of disease was sufficient to enable us to form a correct classification of remedies at present.

Dr. THOMPSON replied, that he thought Dr. BARTHOLOW had misunderstood his meaning. The amount of the dose was what would produce certain symptoms in a limited space of time. He takes exception to Dr. BARTHOLOW'S assertion that digitalis

will cure dilatation of the heart. He does not believe in permanent good resulting from the use of drugs in this condition—the dose must be kept up and repeated. In regard to the use of the word alterative, he had used it in its old meaning as familiar to all.

Dr. MARY PUTNAM JACOBI, of New York, was much pleased with the paper, and called attention to the general molecular action of medicines,—that alkaloids acted by diminishing the oxidation of nerve tissue; thus opium, for instance, diminishes the activity of the intra-molecular oscillation of atoms; mercury, on the contrary, accelerates this intra-molecular oscillation and favors the breaking up of the albuminous molecules saturated with the specific poison. Small doses of morphine produce only perceptible effects on the molecules of *nerve* tissue, poisonous doses extend these effects to *all* the tissues. Thus in opium coma, the elementary respiration is everywhere arrested, oxidation of all tissues deficient, hence the secondary paralysis of the capillaries, which is a prominent feature of opium poisoning. In such a conception of molecular action, we are able to have a comprehensive view of the entire action of the drug; we also have a proof that an influence called "functional" when it is confined to nerve-centres, becomes structural when with increasing doses it extends beyond them.

Dr. THOMSON stated that the anæmia of opium, cited by Dr. BARTHOLOW, was not due to the direct effect of the drug, but to the anorexia which the drug produced. So also of other remedies of this class; they might produce structural changes, but this was not as a direct effect of their use.

Dr. BARTHOLOW moved that the paper of Dr. THOMSON be referred to the Committee of Publication, with the request that it be published. Carried.

Dr. MICHAEL O'HARA, of Pennsylvania, read a paper entitled *A Case of Occlusion of One or More of the Cerebral Sinuses.*

Dr. P. R. BENNETT, of Ohio, asked how the writer explained the improvement, supposing the case to have been one of intercranial thrombosis.

Dr. O'HARA would ascribe it to the use of the iodide and ergot.

On motion of Dr. BENNETT, the paper was referred to the Committee of Publication.

The Section adjourned.

WEDNESDAY, June 2, 1880.

The Section met at 2 P. M.

A paper entitled *Sphygmograms, with Notes of Autopsies*, was read by Dr. H. R. HOPKINS, of New York.

On motion, this was referred without discussion to the Committee of Publication.

Dr. ROBERT W. TAYLOR, of New York, read a paper on *The Use of Chrysophanic Acid in the Treatment of Skin Diseases*, which on motion was referred to the Committee of Publication, without discussion.

A paper to be read, by Dr. J. SOLIS COHEN, of Pennsylvania, for Dr. W. Y. GADBERRY, of Mississippi, on *Artificial Inflation as a Remedial Agent in Diseases of the Lungs*, was read by title, and on motion referred to the Committee of Publication.

Dr. WM. PEPPER, of Pennsylvania, read a paper, *Further Contributions to the Local Treatment of Pulmonary Cavities*.

Dr. W. G. BROWNSON, of Connecticut, moved that the paper be referred to the Committee of Publication, and that the thanks of the Section be tendered the writer.

Dr. BENNETT could not see that the writer proved anything except the harmlessness of operation. The tendency of cavities to heal when under good and proper general and nutritious treatment was well known. In these cases it would be difficult to say whether the local treatment or the general treatment should be entitled to the credit of benefiting the patient.

Dr. D. B. WHITNEY, of New York, asked Dr. PEPPER the result of his experience in treating cases in this manner; would he recommend it in general practice?

Dr. WM. PEPPER replied that he did not think that cavities when left to themselves often heal. In 4000 cases where there were pulmonary cavities, only 81 seemed to be contracting; probably not five ever disappeared; he considered the prognosis to be very serious in this class of cases; he believed the operation to be harmless, and that it benefits the patient in lessening the secretions and the cough, and so modifying the surface of the cavity as to induce it to cicatrize. In most of the cases treated in this manner no medication was given, and the good result was derived from local treatment. He would not advise it in cases of consolidation with active symptoms when a change of climate is possible. He orders it in cases where the physical signs prove obstinate after proper treatment, especially in cases

of simple cavity, also with slight areas of consolidation when a change cannot be given. His paper was presented simply as a contribution on a vexed subject, but he felt a hesitation as yet in recommending it in general practice, for he was not fully convinced of its value.

Dr. WHITNEY said, as a cavity is almost always in a consolidated lung, and as the indications for the use of the injections are very limited, he did not see their practical value.

Dr. BENNETT, of Ohio, said he lived in a country full of consumption, and that he had seen many cases of small cavity entirely disappear under constitutional treatment alone. He believed general treatment to be absolutely necessary, and that local treatment, unless accompanied by general treatment, is useless.

Dr. E. CUTTER, of Massachusetts, said he did not think the operation of plunging needles through the chest would be injurious; but, as he considered the disease in the lung a secondary affection, he did not see what benefit can be given by the injection.

Dr. IRA RUSSELL, of Massachusetts, referred to thirty-four cases of gunshot wound of the chest, of which twelve recovered sufficiently to go home. He thinks the wound made by needles insignificant in comparison to such injuries.

Dr. M. D. WILSON, of Ohio, said, as consumption is a general constitutional disease, it cannot be cured by local treatment; when one cavity might heal, another will be formed; constitutional treatment is essential, and he believed that the chief merit of the paper was in showing that the operation was harmless.

Dr. P. A. STACKPOLE, of New Hampshire, could not understand why a vote of thanks should be given for this paper. It may demonstrate that the dangers of the operation are trifling, but even then this treatment is not advisable. It can be of little benefit, for, in the majority of cases of cavity, the fatal termination of cases is simply a matter of time.

Dr. J. R. BRONSON, of Massachusetts, desired to explain why he made the motion for a vote of thanks to Dr. PEPPER. He considered the paper a valuable one, that it had been compiled with great care and honesty, and he thought it merited a vote of thanks.

Dr. WHITE, of New York, demanded a division of the motion of Dr. BRONSON.

The Chairman divided the resolution, and the motion to refer to the Committee of Publication was unanimously passed.

A motion, expressing the thanks of the Section to Dr. PEPPER, was made and carried.

Dr. J. V. SHOEMAKER, of Pennsylvania, read his paper, entitled *The Treatment of Scrofulous Diseases of the Skin.*

Dr. PER LEE PINE, of New York, said he had used the chlorate of potash extensively among children suffering with slight attacks of scarlatina and sore throat; he was much pleased with it, and he was glad to have it indorsed as of value in other diseases.

Dr. J. P. GARRISH, of New York, said he did not believe in specific remedies. The eruptive diseases arise from various causes, and are not controlled by any specific remedies. He thinks chlorate of potash valuable in certain diseases, as diphtheria and throat affections, especially when given in a proper manner.

Dr. W. B. ULRICH, of Pennsylvania, could not agree with the conclusions of the writer. He believes in the value of chlorate of potash in diphtheria and throat troubles; not, however, in small doses, but given freely. He has used it in scrofulous diseases of the skin, but has seen no benefit whatever. He said he was simply astonished at the results reported by Dr. SHOEMAKER.

Dr. R. W. TAYLOR, of New York, asked Dr. SHOEMAKER for his definition of scrofulous diseases of the skin. He considered lupus a scrofulous disease of the skin; could that be cured by the drug? He considered the statement made by Dr. SHOEMAKER as astonishing. He has used chlorate of potash some ten years in certain subacute forms of disease with good results. He asked Dr. SHOEMAKER to specify the forms of disease which he claimed to have cured by chlorate of potash.

Dr. SHOEMAKER gave his definition of scrofulous diseases, quoting Duhring's work; and said he had found benefit in cases where the lymphatic glands were enlarged and broken down, and the skin was in a diseased condition over it.

Dr. H. G. PIFFARD, of New York, considered the results obtained by the writer as remarkable.

Dr. L. D. BULKLEY, of New York, was much astonished at the results given by the writer—his results differ so completely from those obtained by others. He thought that the Section should take some action in the matter; that a committee should be

appointed to test the drug and report to the Section at the next meeting.

Dr. S. SHERWELL, of New York, said that he too was very much astonished at the results given. He could only say that the writer had been remarkably fortunate, as the good results cited had been obtained by no one but Dr. SHOEMAKER.

Dr. D. B. WHITNEY, of New York, thought that due credit should be given to the writer. His paper seemed to be the result of experience, whilst others spoke here merely in a general way. His statements may seem astonishing to some; so are many things in medicine.

Dr. L. D. BULKLEY said the use of the chlorate of potash was nothing new; it had been used for twenty years.

Dr. SHOEMAKER did not wish to be misunderstood; his paper simply applied to a certain class of cases.

Dr. J. J. CALDWELL, of Maryland, moved to refer the paper to the Committee of Publication.

Dr. L. D. BULKLEY moved, as an amendment, to refer to a special committee to experiment and report at next meeting, and to refer the paper to the writer for further consideration.

The amendment was put to a vote, and lost.

The original motion of Dr. CALDWELL was carried.

Dr. JOHN R. UHLER, of Maryland, read his paper on *Restorative Remedies*, which, on motion, was referred to the Committee of Publication.

The next paper, by Dr. BULKLEY, was made the special order of business at 2 P. M. the next day.

The Section adjourned at 5.30 P. M.

THURSDAY, June 3, 1880.

The Section was called to order by the Chairman at $2\frac{1}{4}$ P. M.

Dr. BULKLEY not being present, the first paper was by Dr. A. D. ROCKWELL, of New York, on *Electrical Treatment of Exophthalmic Goitre.*

Dr. C. K. MILLS, of Pennsylvania, spoke of the importance of definite information as to how galvanism affected the sympathetic system, and to what degree. He believed galvanism beneficial in certain cases, but could not see how it can directly affect the sympathetic. He thought it probable that the sympathetic was affected reflexly, if at all. He hardly thought it possible to apply it to the solar plexus. He had used it in ex-

ophthalmic goitre, with good results; but he thought this was due to the general tonic effect of electricity, and perhaps to its reflex influence.

Dr. J. J. CALDWELL, of Maryland, was thankful to Dr. ROCKWELL for his clear statement of the causes and treatment of exophthalmic goitre. He believed that he and Dr. BARTHOLOW had done much to clear up the mysteries of rare, occult neurosis. He believes this to be a disease of the vaso-motor centres. He knows that electricity is a powerful agent in such cases. He recommended Kidder's faradic apparatus, because of its useful and reliable currents, with steady tension.

Dr. GEO. M. BEARD, of New York, said, it is known positively that we can affect the cervical sympathetic by the electrical current, but the effect is small, and it is a question how much the therapeutical results caused by electrical applications are due to this. He would also say, that the results produced by electricity are not caused by electrolysis or by any chemical decomposition.

Dr. T. S. HARRISON, of Ontario, asked Dr. ROCKWELL how he applied the electrical current.

Dr. ROCKWELL replied, he generally placed the anode in the fossa behind the ear, and the cathode at the back of the neck; sometimes the positions were reversed, and the anode placed on the epigastrium.

Dr. E. CUTTER, of Massachusetts, declared his belief that the good effects are due to the nerves of nutrition. He believes that changes take place not in seven years but in seven minutes. In the treatment of goitre, he regards diet as an important factor. He has not had good results from electricity except when combined with nutritious food.

On motion of Dr. CALDWELL, of Maryland, the paper was referred to the Committee of Publication.

Dr. J. SOLIS COHEN, of Pennsylvania, described a new method of treating chronic pulmonary complaints by artificial inflation of the lungs, and showed a new instrument by which it could be effected.

Dr. L. DUNCAN BULKLEY, of New York, read his paper on *The Use of Sulphur and its Compounds in Diseases of the Skin.*

Dr. J. E. CHANCELLOR, of Virginia, differed with Dr. BULKLEY in his estimate of the value of mineral waters—especially the mineral waters of Virginia. He thinks Dr. B. has not given them sufficient credit. He knew that the Virginia sulphur

waters were of unquestioned and great value in strumous troubles, in the syphilides, and in eczema. There is no doubt sometimes exaggeration in reporting the value of springs, but in these cases their value was unquestioned. He testified also to the value of sulphur waters in parasitic diseases.

Dr. W. B. ULRICH, of Pennsylvania, testified to the good results from sulphur waters in parasitic diseases. He commended the paper, because it did not claim sulphur as a specific, but specially defined its usefulness.

Dr. WM. BRODIE, of Michigan, had not seen the great benefit claimed from the use of sulphur waters. He believed local treatment much more efficacious even in parasitic diseases. He has seen benefit in cases of lead poisoning. He thinks that cleanliness and local treatment are just as good if not better than sulphur baths.

Dr. J. V. SHOEMAKER, of Pennsylvania, said that he differed with the writer in regard to the little value of sulphurous acid internally, and the great value of sulphide of calcium. He had used the acid successfully in pustular affections. He had found the sulphide to produce indigestion.

Dr. L. TURNBULL, of Pennsylvania, said he had recommended the hypo-sulphites for aspergillus twenty years ago. He uses now the bisulphite of soda. He had found the sulphide to greatly interfere with digestion; it produces irritation and dyspepsia.

Dr. E. N. CHAPMAN, of New York, spoke of the value of diet in the treatment of skin diseases. He has used the sulphurous acid and glycerine, one part to three, in cases of eczema, with good results.

Dr. T. J. GALLAHER, of Pennsylvania, spoke favorably of sulphide of calcium; he had not found it to produce indigestion. He thought highly of the sulphur waters in the treatment of the syphilides.

Dr. L. D. BULKLEY, of New York, said it had not been his experience that the sulphides produce indigestion; he gives them in small doses; perhaps large doses might do so. He could not say which he prefers, sulphide of calcium or bisulphite of soda. He fully appreciates the value of nutritious diet in the treatment of skin diseases.

Dr. J. S. LYNCH, of Maryland, said, he had used the sulphides frequently, and had never seen any interference with digestion.

The paper was referred to the Committee of Publication.

A paper on *Diet Cure of Rheumatism*, by Dr. E. N. Chapman, of New York, was read by title, and, on motion, was referred to the Committee of Publication.

Dr. C. C. Wyckoff, of New York, moved that the paper on *Progressive Muscular Atrophy and Pseudo-hypertrophy of Muscles*, by Drs. I. N. Kerlin and C. K. Mills, be read by title and referred to the Committee of Publication. Carried.

A paper was read by Dr. P. V. Gibney, of New York, on *The Strong Galvanic Current in the Treatment of Sciatica.*

Dr. A. D. Rockwell, of New York, said, that electricity in every form would not cure sciatica. He had seen cases cured by the faradic current.

Dr. Bulkley, of New York, referred to two cases which had been relieved by strong currents.

Dr. Geo. M. Beard, of New York, spoke of the relative value of strong and weak currents. He said that electricity would sometimes cure neuralgia, applied in various ways. Practically, Dr. B. found it a matter of indifference which current was applied, although the positive pole was sometimes more soothing and the negative more irritating. He would advise caution, as he had seen cases injured by overdoses of electricity, which should be regarded and used as any other powerful remedy. He would always commence his treatment with weak currents.

Dr. J. J. Caldwell, of Maryland, believed that many forms of neuralgia were due to mechanical interference, to nerve pressure. Here electricity is simply valuable to form a diagnosis. The treatment and cure must be left to surgery—either by stretching or section of nerve.

Dr. C. Denison, of Colorado, moved to refer the paper to the Committee of Publication. Carried.

Dr. L. Turnbull, of Pennsylvania, read his paper on *Hydrobromic Ether.*

Dr. W. T. Taylor, of Pennsylvania, spoke in favor of hydrobromic ether, and moved to refer the paper to the Committee of Publication. Carried.

Dr. Denison, of Colorado, introduced the following resolution:—

Whereas, The maps, giving in shades of color the absolute humidity of the air, in grains of vapor per cubic foot, for each season, for the whole United States, also those giving the amount

of sunshine, similarly illustrated, which this Section at its last meeting ordered to be printed with Dr. DENISON's report, were omitted from the Transactions of last year;

Resolved, That, as these maps are now promised by the Signal Service Office at $6 per thousand for each base map, and $5 per thousand for each additional color, making the cost $11 for complete maps, the Secretary be instructed to procure them for insertion in this year's Transactions. Carried.

Dr. J. J. CALDWELL, of Maryland, read by title his paper, *The Study of Special Nerve-centres*, and it was referred to the Committee of Publication.

Dr. E. CUTTER, of Massachusetts, offered his paper on *The Salisbury Method of Treating Consumption*, which was referred to the Committee of Publication.

The Section adjourned.

ADDRESS IN PRACTICE OF MEDICINE, MATERIA MEDICA, AND PHYSIOLOGY.

By JOHN S. LYNCH. M.D.,

BALTIMORE, MD.

A RETROSPECT of the history of our science, for the past year, will bring to our attention but little to specially interest us in any of the departments of medicine embraced in this section. No startling discoveries have been made; no brilliant inventions heralded to the world; but it must not be assumed that our science has, therefore, been quite stationary. Solid advances have been made in improving our old methods of treatment; and in enlarging the sphere of usefulness, and confirming the value of old remedies. But I can also congratulate the profession and the nation, that its physical health has been exceptionally good; that no extensive epidemics have devastated the country, and carried grief and mourning to the hearts and homes of our countrymen. It is true that yellow fever, which raged with such virulence and fatality in the valley of the Mississippi during the summer and autumn of 1878, appeared again in the city of Memphis in 1879, and destroyed the lives of quite a number of the inhabitants of that ill-fated city. Our profession was again called upon to exhibit its usual heroism and self-sacrificing philanthropy in giving professional succor; and large demands were again made upon public charity and humanity to provide the pecuniary means for relieving the wants and sufferings of the stricken city. Both appeals met with prompt and full responses, and we are again called upon to mourn the loss of noble spirits who laid down their lives in heroic warfare against the pestilence. Your Committee on Necrology will doubtless give you their names, and pay fitting tribute to their memory.

But, thanks to improved sanitation, the energetic efforts of the boards of health, national and municipal, and perhaps also to a better knowledge of the nature and habits of the contagion

or poison of yellow fever, the disease was virtually limited to Memphis and its immediate environment; and we were spared the humiliating experience of seeing the disease once more invade successively both near and distant points in spite of all the efforts which science, aided and supported by abundant pecuniary means, could make to stay its march.

This local and almost trivial epidemic could scarcely be considered of sufficient importance to claim our attention, were it not that two important facts would seem to have been established; and that two long-cherished beliefs or opinions were completely unsettled by the outbreak. These are: 1st. That the germ or contagium of yellow fever can lie dormant for many months of cold and even freezing weather, and still retain its vitality, ready to become energetically active again whenever favoring conditions concur; and like a deadly serpent hybernating through the long winter, rear its horrid crest and dart its envenomed fangs when touched by the genial warmth of summer's sun. 2d. That the lowest temperature experienced in the southern regions of our country, while checking the growth and spread of the germs of this fever, is incapable of *destroying them*, when other conditions favorable to their preservation are present.

These facts seem to be clearly established by the Memphis outbreak where importation seems to have been impossible, as well as by the appearance of the disease on board the U. S. ship Plymouth on her cruise within the tropics in the spring of last year. In the latter case, there was a vessel on board which yellow fever had existed the previous autumn, taken to Boston, Mass., and thoroughly cleansed and disinfected, as was supposed, and exposed to the rigorous climate of that latitude during an entire winter that has become historic on account of its exceptional severity. A new crew was shipped, and she sailed for a cruise in low latitudes, when yellow fever again broke out on board under circumstances which rendered it absolutely certain that its origin was *endogenous* if not autochthonous. It is true that it is asserted that some of the crew shipped on the Plymouth came from Portsmouth or Norfolk, Va., and that the contagion was probably carried on board by them in their luggage. But as yellow fever was not known to exist in those places during the summer of 1878, the argument loses much of its force, and the origin of the contagion remains still unexplained. Admit-

ting, however, that this explanation is the true one, we still have remaining the fact that the germs contained in the clothing and boxes of these men, withstood the rigorous winter of 1878–9 first in Norfolk and afterwards in Boston. These facts would indicate that the poison of this fever has gained the power, by acclimatization or evolution, to withstand the action of a temperature which at one time was, or at least was supposed to be, fatal to it.

It would appear also, from some observations lately made, that the yellow fever poison possesses another peculiarity not before suspected; that is, that, when first emitted or discharged from the subject (whether from the skin, lungs, bowels, or urinary surfaces is as yet unknown), it is not in an active or potential condition, but must and does subsequently undergo a further development or growth, by which it does become active and capable of imparting the disease. This places the disease in that class which Liebermeister (incorrectly, we think) styles "miasmatic contagions," which includes enteric fever, cholera, and probably epidemic dysentery; and accounts satisfactorily for its apparently direct non-contagiousness.

The observations upon this point are as yet few, but seemingly very conclusive. Thus: The bark May Queen, Capt. Benjamin Springsteel, sailed from Rio Janeiro for Baltimore in January, 1878, with a clean bill of health. When three days out, two of the crew were attacked with yellow fever, one of whom died; the other recovered in a few days. About *forty days* after the death of this sailor, when about to enter the capes of Virginia, the weather being cool, three more of the crew were attacked with this fever almost simultaneously. Again: "In the year 1877 yellow fever prevailed as an epidemic at Fernandina, Florida. A gentleman having relatives in Augusta, Ga., moved with a portion of his family to that city to escape the disease. . . . The man himself was in a few days attacked with yellow fever, contracted in Fernandina, and died shortly afterwards with black vomit. Two large Saratoga trunks, containing the clothing of the father and daughter, were opened in the house shortly after their arrival, and *just before* the death of the former. Neither the daughter nor any member of the resident family was attacked with any disease for six weeks. At the end of this time the daughter, who opened the trunks, was attacked violently with yellow fever, and in rapid succession all the other

members of the family developed well marked but mild cases of the disease—which did not extend beyond the household of this family."[1]

Only one more observation will be related in this connection. It seems as conclusive as those already given.

In 1878 the first cases of yellow fever occurring in the town of Chattanooga, Tenn., were a German woman and her child, who had fled from Memphis. Both died. A rigid quarantine was subsequently established, and no other cases occurred for a period of six weeks. Then the disease appeared, as I am informed, in the same hotel where the woman and child had died, and the health authorities were utterly unable to account for the outbreak.

This long interval between exposure and attack, cannot be accounted for by what is called incubation of the poison; for the period of incubation in this disease has been thoroughly established as being within two weeks. The fact can only be explained upon the hypothesis that the yellow fever germ, like that of the typhoid and some other fevers, is not capable of producing yellow fever when first emitted, but must and does undergo a certain development of growth afterwards, by which it acquires a malignant property not before possessed. It is the *germ* of the poison, but not the poison itself. And this satisfactorily accounts for the remarkable fact that this disease, so dreadful in its mortality; so generally prevailing as an epidemic; whose contagion spreads by infection, and can be transported from place to place as easily as a trunk or a bale of goods, is yet never *personally contagious.*

This would seem to be an important acquisition to our knowledge of the natural history of yellow fever; for it clearly explains many anomalous and hitherto inexplicable facts and incidents in the propagation and march of epidemics of this disease. But it is still more important in the power which this knowledge gives us, to control and arrest the spread and diffusion, as well as the growth and multiplication, of the poison. It tells us that upon the introduction of a case of the fever from abroad into a healthy community, we have an abundance of time to destroy the germ of the contagion, before other persons can be infected by it. And it also tells us that in such a case, while there is no

[1] Transactions of the Medical Associatiom of Georgia, for 1879. Dr. Henry F. Campbell on "Yellow Fever Germ."

cause for an immediate panic, and all who can do so have ample time to place themselves beyond the reach of a possible epidemic without danger to those who give them refuge, there is also time enough in which to destroy the germs before they have acquired that malignant vitality or growth by which alone they can become deadly, and that, by destroying all the belongings of a yellow fever patient, and by thoroughly purifying and disinfecting him and all his surroundings, all danger of propagation can be absolutely prevented.

But I need not dilate upon this subject, since all the facts mentioned are now pretty thoroughly understood, and a commission of able and learned medical gentlemen have the matter under consideration, who will doubtless devise the best means of applying our knowledge to the great end so dear to us all, of limiting the spread of epidemics and diminishing the general mortality. I therefore turn from this ghastly subject to another of far greater importance in my estimation, in the hope that I may arouse your attention and excite your efforts to diminish the ravages of some other diseases, which are silently destroying every year, an infinitely greater number of our race than yellow fever and cholera combined. These last only visit us at intervals of great or less length of time; but their destructive effects are so sudden and rapid, the fear and horror they excite are so great, that public attention is thoroughly aroused, and the heart of the nation throbs with pity and compassion, and the full hand of charity is ever ready to extend the means of alleviating the wants and comforting the sorrows of the pestilence-stricken community. But the silent hand of death, in the form of consumption, scarlatina, and diphtheria is annually laid upon thousands, whose departure produces no public excitement, whose deaths are only recorded in the weekly bulletins of the health office, and who leave no memorial behind them except in the stricken hearts and sable garments which meet us in every vehicle and thoroughfare of public travel.

The mortuary reports of the five principal Atlantic cities, Boston, New York, Brooklyn, Philadelphia, and Baltimore, reveal the fact that in the year 1879, 70,369 persons died; and of these consumption caused the death of 11,872, or 16.8 per cent. of the whole number; scarlatina 2666, or 3.87 per cent.; and diphtheria 2357, or 3.36 per cent., making the total mortality from these three diseases 16,895, or 24 per cent. of the total

deaths in these five cities. An examination of the statistics of such other smaller cities and towns as furnish reliable reports, convinces me that the rate of mortality for the whole country will not vary materially from that of these cities. It is almost certain, therefore, that these three diseases alone, destroy more people every year in the United States, than have been killed by yellow fever and cholera in the last twenty-five years.

Two of these at least, diphtheria and scarlatina, are preventable diseases; while no one who has thoughtfully observed the class of people who furnish the largest contingent of deaths from consumption can doubt, that the mortality from this terrible disease might be very materially diminished by improved hygiene in dwellings, in clothing, in food, and in occupations. The last three of these are, perhaps, beyond our help or control; for there must and will be, as long as humanity is what it is, poor people, who, with scanty clothing and insufficient food, must follow occupations necessary to our civilization, which are essentially unwholesome. But the first of these conditions is, partially at least, under our control.

In every large city, and many small ones too—for these, without any good reason whatever, must follow the errors and ape the vices of their more pretentious sisters—are found numerous narrow streets or alleys, varying in width from ten to thirty feet, into which the sunlight never enters except for an hour or two each day. On these narrow, dark, and noisome streets are usually found small houses of ten to fifteen feet front, and two or three stories in height. Quite often every room of these ill-ventilated dwellings is occupied by a family consisting of two to five or more persons. The air in these alleys is close, and heavy with the fetid vapors arising from decomposing garbage and other filth of every conceivable description. A small hillock of offal, of varying but generally of long accumulation, is often found in front of every house; for the street-cleaning brigade visits these purlieus only at rare intervals. The public thoroughfares of commerce and fashion are kept scrupulously clean, but these alleys are generally neglected, and cleaned only when the foul odors emanating from them are complained of by some influential neighbors.

Quite often, too, even in these narrow passages, as well as on wider and more pretentious thoroughfares, "basements" or underground apartments are found, either inhabited by one or

more very poor families, or occupied as kitchen, dining, and sitting room by others in better circumstances, and who ought to have better sense.

It is in these noisome alleys and damp basements that consumption, diphtheria, scarlatina, and rheumatism find their congenial homes; and here, too, the best efforts of physicians at successful treatment are baffled by the insanitary and deadly surroundings. No one can doubt the influence of bad air—I mean air deficient in oxygen, and diluted and poisoned with carbonic dioxide, sulphuretted and carburetted hydrogens—in causing and predisposing to those numerous nutritive derangements which tend to induce tuberculosis and catarrhal pneumonia. Can it be wondered at, then, that in cities where hundreds of thousands of people live in dwellings such as I have described, so many thousands should die of consumption? In New York and Brooklyn alone, in the year 1879, 5990 persons died of this disease. Had yellow fever killed one-half this number a storm of indignation at the inefficiency or supineness of your health authorities would have arisen not only in your city, but all over the country, and you would have expended millions of dollars in stamping out the pestilence.

Now, while it is perhaps vain to hope that consumption, diphtheria, or scarlatina will ever be completely banished from the world, no one will deny that by removing the insanitary conditions I have mentioned, the number of cases of these diseases would be most materially diminished; while the mortality of the remaining cases would be correspondingly lessened.

Here, then, O my brothers, is a field in which all of us can labor for the good of our common humanity, and in which we can ultimately accomplish far more good than by a vain search after drugs with which we may idly hope to combat disease or repair the destruction it has wrought! Let us unitedly raise our voices so loudly, and proclaim our protests so often, against this fatal overcrowding of population, that even the deaf ears of the politician will hear us; and so, laws may be enacted which will lay their restraining hands with iron force upon the greed of landlords, and save the people from the consequences of their own stolid ignorance. Even if we fail to eradicate present existing evils, we can hope, at least, to so educate public opinion, that their repetition will be impossible, and that in the building of new cities, as well as in the enlargement of old ones,

narrow alleys and damp basements for dwelling-places shall be forever prohibited.

ANTIPYRETIC MEDICATION.

There is probably no greater advance in practical medicine, and no improvement in our methods of treatment more useful and conservative, made within the last three hundred years, than that which we call antipyretic medication. Since the general adoption of this plan of treating acute disorders attended with fever, there can be no doubt that the death-rate has been most materially diminished; while our patients recover with far less loss of flesh and strength, and consequently convalesce more rapidly, than under the older destructive or spoliative plans, or even the purely expectant system. The success of this comparatively new method reveals to us what an important role *fever* played in protracting disease, as well as in determining fatal results. Under this plan even consumption, and other ultimately fatal diseases, are protracted in their course, the fatal termination postponed, and in some cases actual recovery secured; and thus the aggregate duration of life increased.

Even that disease which we call rheumatism or rheumatic fever, long one of the opprobria of medicine, so much to be dreaded on account of the weeks of suffering involved in an attack, to say nothing of its terrible and fatal complications, is found to yield promptly to an efficient antipyretic. The fact is attested by thousands of observers, that this disease will yield promptly, often in a single day, to efficient doses of salicylic acid or its sodium salt. But it is found that this drug does not exert any peculiar or specific influence over rheumatism, as was at first supposed. It cures only by its antipyretic action, and any other substance capable of producing an equal antipyretic effect is equally as efficient in curative power. Thus salicin, quinia, and other alkaloids of cinchona, and many other antipyretics, are found to be equally efficacious as the salicylic acid. Advantage is undoubtedly derived by combining arterial sedatives and anodynes with the antipyretic. When thus combined, their action in relieving the pain and fever attending rheumatic inflammation is almost marvellous. Patients often say, after taking two grammes of sodium salicylate with one centigramme of morphiæ sulph. and thirty centigrammes of tinct. verat. viridi, that their sense of relief is absolutely indescribable.

This dose should be repeated every third hour for twenty-four hours, and at longer intervals for two days afterwards.

Sixty-five centigrammes (65 cg.) of quinia, or 75 cg. of any one of the other alkaloids of cinchona, will be found fully as effectual as the salicylic acid. If we had made no other advance than this in the last fifty years, it would establish our claim that medicine is a progressive science; for probably few other discoveries in that time, if we except anæsthetics, have contributed so much to the relief of human suffering.

My reason for bringing this subject, which can hardly be called new, to your attention at this time, is that during the past winter I read a clinical lecture by a very eminent teacher in one of the oldest and most reputable medical schools in our country, in which it was most positively stated that we possess no means whatever of controlling or in the least shortening the duration of acute rheumatic inflammation. As it is morally certain that the gentleman alluded to has never given the antipyretic system a fair and honest trial in this disease (else it would be impossible for him to hold the opinions he expresses), and as his influence is great, and his standing high both among students and physicians, too strong or too public a condemnation of such teaching is hardly possible.

The great value of antipyretics (as distinguished from apyretics) in the treatment of all diseases attended with pyrexia, being established, every new addition to this class of medicines is valuable, since, with a large number to choose from, we are able to make a nicer adaptation to suit the varying conditions and complications with which we are often confronted.

Frequent accidents in the use of injections of solutions of carbolic acid into the peritoneal, thoracic, and uterine cavities, in which a notable fall of temperature along with symptoms of collapse were observed, have led to the conclusion that this medicine might be used in doses that were yet safe, in febrile diseases, to secure defervescence. Accordingly we find in the *London Lancet* a report of several cases of typhoid fever treated with this drug, in which a marked fall of temperature was noticed and the duration of the disease materially shortened. The dose used in these trials was six drops of the glycerite of carbolic acid every three or four hours. As this dose is much smaller than any of the other antipyretics, and as it is less disagreeable to the taste than quinia or other cinchona salts, and less nause-

ous than salicylic acid and its compounds, the remedy may prove a very valuable one in the pyrexial condition.

MATERIA MEDICA.

The American Journal of the Medical Sciences for October, 1879, gives an account, taken from the *Berliner Klinik. Wochenschrift*, No. 19, 1879, of the experimental observations of Dr. F. Penzoldt, of Erlangen, on both man and animals, with a new drug, the bark of the *Aspidosperma quebracho*, obtained from Brazil. The form of preparation used was a watery solution of an alcoholic extract of the bark; ten parts of the latter being percolated with one hundred of alcohol for several days, and the liquid filtered, evaporated, dissolved in water, again evaporated to dryness, and the residue dissolved in twenty parts of water. Four grammes or one teaspoonful of this solution were given three times a day to persons suffering from both pulmonary and cardiac dyspnœa with very marked relief to that symptom. Afterwards Drs. Berthold of Dresden, and Picot of Carlsrühe, also used Dr. Penzoldt's solution in various diseases, as asthma, emphysema, bronchitis, phthisis, and pneumonia in which dyspnœa existed, and always with great benefit in relieving the dyspnœa. Dr. Picot experimented also upon himself with the drug, and found that he could climb mountains with much less excitation of respiration and pulse, with, than without the drug. Prof. Skoda, of Vienna, also relates in the *Wiener Medicinische Blatter* (No. 41, 1879), that he not only found benefit himself from the use of quebracho, but prescribed it for others with success. Without exciting the pulse, the medicine reddened the previously livid and cyanosed lips and face, and in a patient whose nose was the seat of acne hypertrophica, the ordinary violet-blue color of the organ became fiery red. It would seem that the medicine acts by increasing the capacity of the blood to absorb oxygen, since it was observed that the addition of quebracho solution to blood in the presence of oxygen caused it to assume a bright red color. If this is found to be true, the medicine will have a very wide range of usefulness; since many diseases attended with impaired nutrition and mal assimilation might be benefited by such an agent. But even should this expectation fail, it will, if further trial confirm the good accounts we already have of it, prove a precious boon to patients suffering from emphysema, asthma, advanced phthisis, and heart disease; relieving the dyspnœa and

orthopnœa so distressing in advanced stages of those diseases, and enabling them to sleep comfortably in the recumbent position, which they are sometimes unable to do for months before death terminates their sufferings.

Aconite has long been regarded as a useful remedy in neuralgia and rheumatism; and some observations by Dr. Oulmont, published in *Le Progrès Medical* of Dec. 6, 1879, translated in the *American Journal of the Medical Sciences* for April, 1880, with the alkaloid aconitia, would seem to confirm our previous estimate of its value. In those forms of facial neuralgia commonly called congestive, and those arising from exposure to cold, it seems to be specially useful, while in the intermittent or distinctly periodic forms, it is inefficient or only valuable as an adjuvant to quinine. As the drug is so powerfully energetic, its tolerance should be tested at first by doses of one-fifth milligramme three times a day, and increased one-fifth milligramme per day. In acute rheumatism it is said to be also very effective, but as in this disease it probably only cures by reason of its antipyretic action, its use would seem to be superseded by other safer and more active medicines of that class.

This meagre account, gentlemen, embraces all that I have been able to collect from current medical literature which is new, and at the same time of sufficient importance to bring to your attention. It is little, but we must remember that it has been by slow accretions our science has built up the enduring edifice which constitutes the temple in which we worship. It must be remembered, too, that our progress within the past century has been so great, and every field of inquiry has been so carefully and laboriously explored, that little has been left for the workers of to-day to discover. During this period medicine has made more advances towards a perfect science, and bestowed more boons on suffering humanity than in all the previous centuries of its history.

Within this brief time, medical chemistry, by isolating the active principles of medicines, and discovering new compounds of inorganic substances, has furnished us with nicer and more pointed weapons with which to wage warfare against disease.

Anæsthetics have lifted the primeval curse from woman, and deprived the surgeon's knife of all its horrors.

The operation of ovariotomy, invented by our countryman, McDowell, has redeemed thousands of women from certain death;

while the invention of the metallic ligature by Le Vert has enabled Sims and his followers to rescue other thousands from abject wretchedness and loathsomeness by the cure of vesico-vaginal fistule.

Auscultation and percussion have, by opening up to us a new method of investigating diseased organs, added to man another sense; and by the application of their principles the merest tyro of to-day can pronounce with certainty upon diseased actions that would have baffled Sydenham or Cullen in the meridian of their powers.

The thermometer has again been called in to aid in the correction of diagnosis; and by its aid we can now pronounce at once upon the nature of diseases, where formerly we were compelled to wait many days for the slow, perhaps fatal development of symptoms.

The ophthalmoscope and laryngoscope have opened to our inspection, living organs never before revealed to human vision; and the treatment of their diseases, thanks to the aid furnished by these instruments, has become as exact and scientific as it was before uncertain and empirical.

The hypodermic injection of medicine has enabled us to bid defiance to nausea, and relieved us of all doubt and uncertainty as to the effect of our remedies.

The microscope has thrown a flood of light upon the nature of those finer pathological changes which formerly lay beyond our vision, and has revealed the secret of many physiological processes; and by making possible the cellular pathology, as expounded by Virchow and improved by his pupils, Cohnheim and Recklinghausen, has added another to the long list of obligations under which in this century it has placed the science of medicine.

This list of its solid advances, and of the obligations under which medical science is placing the human family, might be almost indefinitely lengthened, for every year is adding some new gift of science, some new boon conferred. But I have said enough to show you that we have constructed a temple imposing in its dimensions, grand in its proportions, venerable in antiquity, and glorious in beauty.

"See where aloft its hoary forehead rears,
The towering pride of twice a thousand years.
Far, far below the vast incumbent pile
Sleeps the gray rock from Att's Ægean isle;

Its massive courses, circling as they rise,
Swell from the waves to mingle with the skies:
There every quarry lends its marble spoil,
And clustering ages blend their common toil:
The Greek, the Roman, reared its ancient walls;
The silent Arab arched its mystic halls.
In *that* fair niche by countless billows laved
Trace the deep line that Sydenham engraved,
On yon broad front that breasts the changing swell,
Mark where the ponderous sledge of Hunter fell.
By that square buttress, look where Velpeau stands,
The stone yet warm from his uplifted hands."
There where the western sun pours down his rays,
And gilds the efforts of more recent days,
Mark that proud column—our eyes its splendor dims—
Quarried by Rush, and reared by Sayre and Sims.
"And say, O Science, shall thy life-blood freeze
When fluttering folly flaps on walls like these?
No! they will stand through all revolving time
Firm, imperishable, and sublime."

CASE OF RECOVERY FROM OCCLUSION OF ONE OR MORE OF THE CEREBRAL SINUSES.

By M. O'HARA, M.D.,

PHILADELPHIA, PA.

On March 1, 1880, I was called to see Miss M., a robust white person, twenty-two years of age. She had been complaining since February 22d of general and local pains which she called neuralgia, but now her complaint was especially of œdematous swelling about the eyes and face and atrocious pains in the head; the pain was constant and tensile, but with exacerbations of severity. The pains and swelling were most marked in the face, temporal and frontal regions, and more manifest on the right side. The pains in the temporal region seemed to alternate in severity with the changing appearance of venous distension in the forehead, nose, eyes, temples, and the whole orbital region. There was internal strabismus of the right eye; the pupils were normal; the eyes were protruded, the right eye more than the left; there was ecchymosis of both conjunctivæ.

Negative points were the absence of sweats and vomiting, though nausea was present. No definite motor paralysis could be made out, but the grip of the right hand seemed weaker than the left.

On having her to stand and walk a few feet with eyes shut, she fell unless supported. There was hyperæsthesia of the left cutaneous surface, and anæsthesia of the right. The recognition of impressions on either side was uncertain. Vision was not impaired. The hearing was defective on the left side, but this she stated to have been the case for years. The tendon reflexes were normal. Her mental condition was unaffected. There was general fever, pulse 100, and respiration more frequent than normal.

The only history afforded as to causation was that she had fallen eighteen months previously, and had struck upon her right knee; since, she had pains and swelling in the right and

left knees and ankles, and pains in the leg bones, which remained continuously in the right tibia. There were present periosteal inflammation and thickening of the right tibia.

The diagnosis was made of complete or nearly complete occlusion of one or more of the basal cerebral sinuses either from internal or external causes, and was based on the local appearances and the history given by the patient; the circulation being so obstructed as to cause a damming backward of the blood in the ophthalmic veins into the facial veins, which ought to have been emptied into the cavernous sinuses.

The treatment ordered was cupping, free purging, the use of bromides and ergot in large quantities, morphia to relieve pain and procure sleep.

On March 2d Dr. C. K. Mills met me in consultation, and concurred in the diagnosis. He co-operated with me afterwards in the management of the case. The pain was greater and more diffuse over all the region before mentioned; the conjunctiva was more ecchymosed; the strabismus was decided; there was very marked collateral venous distension over the whole face, nose, and temples. Urination was less free.

The same treatment was continued, and it was deemed prudent, lest there be some blood contamination, to add the use of iodide of potassium and bichloride of mercury.

On the third, there was an amelioration of all the head symptoms. She required morphia for sleep, as the insomnia was distressing without it. No change was made in the treatment. Severe purging by senna and salts appeared to have a happy effect.

On the fourth, she complained of a throbbing pain in the right side of the head, with each beat of the heart; the headache was very distressing, but was relieved by morphia frequently given. She had annoying pruritus and formication over the whole body, which was palliated somewhat by washes of borax and muriate of ammonia.

On the fifth, she had very much pain, as if the head would burst; she was delirious, and had illusions, but no permanent hallucinations. The squint had disappeared. Her pulse was 108, and her temperature 103°. Her local head temperatures were taken at three stations—a central frontal in the middle of the forehead, and a lateral frontal just above and behind each external angular process of the frontal bone. The results were—

Central frontal	$99\frac{1}{2}°$
Right lateral frontal	98
Left lateral frontal	$96\frac{1}{2}$

Her right knee was painful and swollen; the left was also painful. Her grip was equal in both hands.

On the sixth, she showed a remarkable improvement which came on in the course of a few hours. She slept well and without any narcotic for four hours, and made no complaints until later in the day, when swelling and pains in the left knee and scattered pains over the body appeared. She was now kept on bromide and reduced quantities of the iodide, with mercury.

On the seventh, she slept tolerably well and continued better. The superficial sensibility of the body was normal. The knee was less swollen. The ecchymotic condition of the eyes was disappearing. The temperature record was—

General temperature (axilla)	102°
Central frontal	$98\frac{1}{2}$
Right frontal	$98\frac{1}{2}$
Left frontal	$98\frac{1}{2}$

She complained of a beating sensation on the right side of the head anteriorly. There was a purplish blotch on the right molar bone, one and a half inches in diameter, of irregular outline between the eye and ear. The conjunctival ecchymosis, the ocular protrusions and nasal swelling, present the day before, had all left.

On the eighth, she was doing well, but had some slight delirium. The pulse was 82 and temperature $100\frac{1}{2}°$.

On the tenth, she vomited occasionally, was melancholy and complained of flying pains.

Up to the twentieth she steadily improved, but on this day she complained of gastric distress and a smothering feeling in breathing.

On the twenty-third, she had neuralgic pains in the left side of the body and a rectal abscess was opened.

On the twenty-fourth, she felt quite stupid; the left side of the body, particularly the leg and foot, felt weak. The rectal abscess was discharging.

On the twenty-ninth, she had much pain in various joints, and felt mentally enfeebled. Her left arm and fingers felt weak. She could not cut with the scissors (her usual occupation).

On April 3d, the last day she was seen, the symptoms noted

had all disappeared; though weak, she was otherwise well and at work.

The chief features of this case may be summarized as follows: The patient had suffered for several weeks with scattered neuralgic pains, when she was taken down suddenly with great pain in the head and œdema of the right side of the face, temples, and orbital region, with conjunctival ecchymosis and ocular protrusion; the left side soon became involved in the same condition. Paralysis of the right sixth nerve occurred, and the patient suffered from throbbing pain in the right side of the head, weakness of the limbs, and want of co-ordination, and varying conditions of sensation in the two sides of the body were present. General fever, accompanied by local increased temperature, persisted until the sudden disappearance of the severe head symptoms and the paralysis of the sixth nerve.

How can we account for these phenomena and their fortunate and unexpected disappearance? It would seem to me that a blockage of the intracranial venous circulation could alone account for the train of symptoms, which were undoubtedly those of venous stasis; the parts exhibiting this stasis were those drained by the ophthalmic veins and the portions of the facial vein communicating with it. The facial vein communicates at the inner angle of the eyes, by the angular vein which receives the blood of the veins of the alæ nasi and superior palpebral veins. The ophthalmic veins terminate in the cavernous sinus; and the cavernous sinuses on each side are in communication with the circular sinus, so as to completely surround the pituitary body. It seems to me that the blockage of the right cavernous sinus subsequently extending by way of the circular sinus to the left cavernous sinus might account for the local manifestations present in this case. The paralysis of the right sixth nerve could be explained by pressure upon it either in its course through the cavernous groove or in its passage through the sphenoidal fissure.

If a thrombus were present in the right cavernous sinus, this might have accounted for the condition, or the distended ophthalmic vein passing through the sphenoidal fissure may have pressed upon the nerve.

Thrombosis of the transverse sinus is said to occur with more frequency than thrombolic disease in any other intracranial location. This is owing to the fact of its being more likely to

become involved in local disease of the ear and of the petrous portion of the temporal bone; but no evidences of local disease or injury were present. Undoubtedly, however, involvement of the cavernous sinuses with the transverse, would explain the manifestations almost as well as the view of the conjoint implication of the circular and cavernous sinuses. This, after all, however, is not a matter of great moment.

The history, course, and termination of this case favor the idea that it was one of true phlebitis, and that the probable occlusion was not of the nature of a marantic thrombosis. It is well known that most of these cases of phlebitis sinuum arise from special local causes, as disease of the cranial bones, the latter accompanying suppurative inflammation of the middle ear. No evidence of this kind was discoverable. According to Nothnagel,[1] proof is wanting for the fact that phlebitis of the sinuses can arise as a spontaneous and primary affection. Under the influence of some specific condition of the blood, however, I see no reason why inflammation of the inner walls of the cerebral sinuses might not occur.

No furuncles were present about the face or body. I am inclined to think that the rectal abscess indicated depressed vitality in the patient, rather than that it had any relation to the cerebral condition.

The case was certainly not one of erysipelas. The erysipelatous appearance did not precede the ocular and intracranial manifestations. We had, in fact, a "pseudo-erysipelas," as Rosenthal calls it, but no true erysipelas. The recovery of the patient precludes the supposition of an intracranial abscess.

Pressure upon the sinuses, arteries, and certain of the cranial nerves by a tumor or exudation, might have given rise to most of the symptoms presented, but the symptoms evolved in such a case would not have arisen with such rapidity.

Congestion of the brain would hardly remain so persistent as in this case; there was passive congestion from stasis due to obstructed circulation from the apparent thrombosis of the sinuses. If there were acute congestions of the brain, we should have had apoplectic symptoms, which did not appear in the history of the case.

The result of the treatment instituted would seem to bear out the view that the case was one of phlebitis.

[1] Ziemssen's Cyclopædia of the Practice of Medicine, vol. xii. p. 211.

Authors of American text-books have paid comparatively little attention to the subject of cerebral thrombosis. Da Costa's Medical Diagnosis finishes the matter in six lines, thus: "Thrombosis of the sinuses of the brain may occasion partial palsies, and the symptoms of cerebral pressure, like those of tumors, and cannot be distinguished except in those instances in which we can find distension of the collateral circulation and injection and œdema of the forehead and eyelids. Convulsions, further, are very rarely among the symptoms."

Flint is taken to task by the *Dublin Medical Journal*, Jan. 1880, p. 183 (Review of "Clinical Medicine"), for giving, among the symptoms of thrombosis of superior longitudinal sinus, exophthalmia due to post-ocular venous congestion. The reviewer thinks the exophthalmia should be regarded as evidence of blockage of the petrosal sinuses, one or both, or of the corresponding lateral sinuses, into the former of which the cavernous sinus debouches; not into the superior longitudinal sinus, with which it has no anatomical connection whatever.

Hammond[1] expresses his doubt that cerebral thrombosis (venous) possesses a symptomatology so as to admit of its being identified during life. He mentions as symptoms, headache, convulsions, paralysis of different parts of the body, particularly of the ocular muscles, squinting, double vision, etc. etc. Again, at p. 137 he says: "if the clot is small (of vein or sinus) and removable, the case may be favorable, depending upon our judgment of the course of the affection and the severity of the symptoms."

Nothnagel[2] has a fair article on cerebral thrombosis. He says: "The relations of the sinus cavernosus to other veins are such as to give rise, under the fitting conditions, to pronounced and characteristic symptoms. These were noticed by some of the earlier observers, but especial stress has been laid upon their diagnostic importance, within the last few years particularly, by Corazza Heubner, Huguénin, Genoivelle, and others. The ophthalmic veins are the ones through whose agency these symptoms are brought about. Thus, in case of thrombosis of the sinus cavernosus, venous hyperæmia of the fundus oculi has been observed, as well as œdema of the eyelids and the conjunctiva, together with prominence of the eyeball, due to hyperæmia of the retro-bulbar veins and of the vena frontalis. These symptoms

[1] Diseases of Brain, p. 133.

[2] Ziemssen, vol. xii.

may persist until the death of the patient, or they may disappear during life. In cases of thrombosis of the cavernous sinus, one important symptom may be present which is peculiar to the affection of that vessel, and is due to the fact that, in its walls and neighborhood, various nerve trunks are disposed which are liable to be irritated or paralyzed by the pressure of the thrombosis (or the swelling of the peri-venous connective tissue), an accident from which important symptoms must result; these nerves are the first division of the trigeminus, the trochlearis, the abducens, and the oculo-motorius. In this way a paralysis of the motor nerves may arise, and in a case reported by Lebert there was neuralgia in the distribution of the upper branch of the fifth nerve and a trophic disturbance of the eye, such as may be produced experimentally by section of this nerve.

"In the presence of the conditions just described, which admit of being objectively recognized, and by a careful consideration of all the attendant symptoms in the case, it might certainly be possible to arrive at a diagnosis which would have more than probability in its favor. It is evident that all the symptoms due directly to venous stasis may be present as well in cases of phlebitic thrombosis as in those of the simple marantic thrombosis."

In the *Transactions of the American Ophthalmological Society* for 1875, is an article by Dr. Geo. C. Harlan, of Philadelphia, on two cases of vascular disease of the orbit; in which the view is strongly presented that many cases of supposed orbital aneurism are in reality cases in which the return of blood through the ophthalmic vein is prevented by some pathological condition. The strong assertion is made that with the exception of one case recorded by Guthrie, we are without positive proof that such a thing as an aneurism of the orbit has ever existed. Brief notes are given of fourteen cases. "Competent observers had committed themselves to the diagnosis of orbital aneurism in nearly all the cases, and in the remainder the same conclusion could hardly have been resisted by any surgeon whose attention had not been particularly called to the subject. In only five cases was there anything like an aneurism, and in them the arterial lesion was so situated that it would be the cause of the orbital symptoms only in the same manner as any other obstruction to the venous flow might be." Four were cases of venous clot from phlebitis, and in three cases malignant growths were present.

I have referred at some length to Dr. Harlan's paper to impress the fact that obstruction of the cerebral sinuses, and particularly of those which communicate with the ophthalmic veins, is, comparatively speaking, not uncommon. The cases here collected were chiefly instances of chronic conditions; the case which I have just reported was acute in character; but the reasoning in regard to the possibility and probability of obstruction of the sinuses at the base of the cranium, will apply equally to acute or chronic cases.

ARTIFICIAL INFLATION AS A REMEDIAL AGENT IN DISEASES OF THE LUNGS.

By W. Y. GADBERRY, M.D.,
YAZOO CITY, MISS.

The great uncertainty attending the introduction of new discoveries in the medical profession impresses me with diffidence and distrust of my own judgment, and has delayed for a year the public announcement of a remedy which seems to possess more than ordinary merit. Even now, after assurance of confidence from a distinguished source, I am disposed to withhold much that I would like to say in its favor. I allude to artificial inflation of the lungs as a remedial agent in disease. It occurred to me after reading a history of the use of condensed and rarefied air, that it was expensive and inconvenient, and that the intervals were too long to accomplish the desired effect. I then sought for an instrument which could be used at the discretion of the patient, and one that would be in reach of the poorer classes. One was improvised by removing the spray-tubes from a Richardson hand-ball and bulb-atomizer, and inserting in place of the spray-tube a mouth-tube. After repeated trials on myself, I became satisfied that fresh air could be forced into the lungs in the following manner: insert the mouth-tube into the mouth with the left hand, take a deep inspiration, and with the fingers of same hand close the lips and nostrils, and work the hand-ball rapidly with the right hand so long as the patient can bear it. In a healthy subject the operation is painless, and may be prolonged for a minute or more; but in a subject with disease of the lungs, it is at first disagreeable, though not painful, and the patient complains that he cannot force in much air. Practice soon enables him to pump the air freely into the lungs for a longer period of time each day. After frequent use it affords great comfort to those who suffer from a feeling of suffocation, and have diminished capacity of these organs.

In the fall of 1878 I determined to try the remedy. The first case presented on the 12th of February, 1879, after having undergone a course of cod-liver oil without benefit. The following is the history recorded at the time:—

William Lamb, aged 32 years, carpenter, has been losing flesh twelve months; weight in health, 147 pounds; can trace no family taint; now weighs 114 pounds; has suffered with short breath and pain in the side for three months. Condition now: pulse 110; respiration 36; temperature 102; hectic flush and fever; harassing cough; muco-purulent expectoration, containing cheesy matter. Careful exploration of chest revealed tubercular deposit in both lungs, and cavities were suspected, though not positively demonstrated; has night-sweats, and sleeps badly. He was taught the use of the instrument, and directed to use it every two hours. February 16th, had used inflation faithfully since the 12th, but gained nothing that he could discover. Dr. J. P. Moore, of this city, now examined the patient carefully, and several times subsequently, and fully concurred with me in the diagnosis. 18th. P. 100; R. 30; T. 101; cough and expectoration increased; sleeps but little. 19th. P. 100; R. 30; T. 99½; myoidemia distinct over apices of lungs on percussion. 20th. P. 106; R. 36; T. 101¼; has pain in left side, and sleeps but little; ordered five grs. morphine to be divided in ten powders, one to be taken at night. 21st. P. 100; R. 32; weight 114 pounds; sleeps better; gaining strength; spends nearly all his time inflating his lungs. 24th. P. 100; R. 32; weight 118 pounds; works some every day, and feels better. March 1st. He has become quite dexterous in using the instrument, and inflates his lungs every half hour during the day, and when he is awake at night; ordered to the country with directions to use all the milk he can take, and to work in open air constantly when not fatigued. Before leaving the city, Dr. R. L. Dunn, of this place, examined him, and pronounced his case one of phthisis. 20th. Returned to the city after an absence of twenty days much improved; P. 95; R. 27; gaining strength and appetite. April 5th. Returned after an absence of fifteen days; P. 86; R. 24; weight 123 pounds, a gain of 9 pounds since 12th of February; improving in every respect; works most of the day; carries pump in his bosom, and uses it almost unremittingly; expresses great confidence in its efficiency; has taken the ten morphine powders, but no other medicine; no cough,

pain, or fever. 17th. Absent twelve days; reports himself as feeling well and able to work all day; weight 131 pounds. 28th. Absent thirteen days; reports rapid improvement; P. 76; R. 24; weight 136 pounds; apparently well. May 22d. Reports himself well; weight 142 pounds; gets full wages at his trade; returned his inflator badly worn from use. Lamb continued well, and left the city during the following winter. This man had youth, vigor of constitution, and good digestion, all favorable to restoration of health, but his improvement was so rapid under inflation, and his recovery so perfect from a condition usually considered hopeless, that I am induced to believe he would have died without it; and as no other agents were employed, the recovery must be attributed to inflation alone. That cavities existed in his lungs was evident from the cheesy muco-purulent expectoration, but they were not positively demonstrated by exploration.

April 12, 1879, John Moyer, aged 56 years, asked the privilege of using inflation. He had been sick three years; had large cavities in his lungs; fever and night-sweats; much emaciated; normal weight 144 pounds; now 118 pounds. His case was hopeless, but he was instructed to use inflation; P. 104; R. 32; T. 102. 18th. Used inflation six days, and feels some better; less pain and more sleep than before using the instrument; P. 92; R. 26; less fever, better digestion, and more strength. He inflated often, and stated that he could not talk freely without cleansing the matter from his lungs, which sometimes had to be repeated several times before his voice could be distinctly heard. It gave him much relief from suffocation, and afforded comfort during the night. He stated that often during the night he awoke with an oppression and difficulty of breathing, which would be immediately relieved by inflating his lungs. His strength and appetite improved, and he was enabled to pass through a long, hot summer without confinement to bed, and with comparative freedom from pain and dyspnœa. Some time during the winter he left here for Philadelphia (his former home), forgetting his inflator. On his arrival at his northern residence, he immediately wrote for it, saying that he would suffocate without it. His death was reported this spring.

Charles Bracy, colored, aged 40 years, had pneumonia, and now has gangrenous abscess with extensive deposit of tubercles.

Having no hope for his recovery, I allowed inflation as an experiment. At the expiration of a week the offensive odor was nearly relieved, and his fevers had abated. No permanent improvement resulted, and he died in about two weeks.

This case is related to show that inflation will, to some extent, disinfect diseased lung tissue.

Cases having received the benefit of internal medication are excluded from this paper for obvious reasons, but the subjoined extract from a letter written by Dr. B. R. Holmes, an intelligent and experienced physician, is worthy of consideration:—

YAZOO COUNTY, MISS., April 1st, 1880.

DR. W. Y. GADBERRY.

DEAR SIR: My wife, aged 49, has been suffering for many months with cough, pain in left lung, expectorating from six to ten ounces of pus every night; has evening fever, followed by profuse sweats; no appetite, but a loathing for food; constipation, loss of sleep, and chills recurring monthly. In January last she was examined by two highly cultivated physicians, who diagnosed her case one of consumption; one of whom asserted the existence of a large cavity in the left lung. She has dyspepsia, a disease hereditary in her family; has lost flesh rapidly. She has taken the usual remedies, as malt, cod-liver oil, quinine, iron, podophyllin, etc. After several weeks' use of these remedies, pain developed itself in the right lung just under third and fourth ribs. About this time I consulted you (as I had lost all hope). You kindly offered me your lung inflator, urging a persistent use of the instrument, saying that it would require some time to develop marked effect. The first effects of inflation were increased cough, followed by large expectoration. After the lungs were freed by forced expectoration, she could inflate without pain. At first inflation caused exquisite pain, but at the end of a week she complained much less; nor has she suffered with the right lung since relieved, thus confining the disease to the left lung. I find her now with marked improvement, and have abandoned all drugs. I am using at this time London porter as a tonic and appetizer. Could I prevail on my wife to make more constant use of the inflator, I honestly believe her life would be prolonged. As she is now in Yazoo City, I beg that you see her, and convince her of the necessity of constantly using inflation. I feel certain

that it has eradicated the pain in the right lung, which was constant and acute before using the pump. It forces expectoration until the cavities are cleansed, after which it dilates the torpid air-cells, and gives motion to the vessels about the cavities, which the unaided muscles could not do. She is improving in strength and appetite. Can sleep sweetly the better part of the night. In the day she is able to attend to her household duties and the dairy. I am not vain enough to suppose her relieved or cured of consumption by my management of her case; but, thanks to an All-wise Providence, I think she will be spared to me for yet a few years. Her fever and sweats are not prostrating, and she expectorates but little; has more appetite, and better digestion. I must again thank you for the air-pump, from which I hope so much, based on the evident improvement in my wife's case, which I honestly believe has been accomplished by the—not assiduous—use of your lung inflator.

Very respectfully,

B. R. HOLMES.

May 2d, 1880, Mrs. Holmes continues to improve. The history of this case corresponds with my own observations. From the relief afforded to the right lung, and the improvement of the general health, it is reasonable to infer that if inflation had been adopted in the early stage of the deposit and persistently used, the disease would have been arrested.

The result of Lamb's case, the first mentioned in this paper, was an agreeable surprise, and seemed hardly credible. I accordingly wrote to Dr. J. Solis Cohen on the 5th of May, 1879, detailing my plan of treatment by inflation, and requested him to institute experiments to determine its value. He has kindly performed that duty, and now consents to make known his views, which will settle the question of its utility and range of application.

While observing the effects of inflation, the following notes were written and are now respectfully submitted to the profession:—

Inflation forces fresh air into the lungs, expanding unused capillary tubes and air-cells; displaces the residual air and noxious gases; excites cough and expectoration, which removes morbid secretions at once, thereby lessening the danger of infection from unhealthy accumulations, and obviates the necessity for

expectorant medicines, which often disturb the digestive organs; oxygenates the blood; promotes absorption; relieves dyspnœa; gives impetus to pulmonary circulation; reduces temperature in fever; and desiccates the fluids in the air-passages.

Beneficial effects may be derived from it in croup, diphtheria, bronchitis, asthma, tuberculosis, whooping-cough, asphyxia, chloroform poisoning, shock, foreign bodies in the air-passages, and many other obstructive lesions of the pulmonary organs.

By inflation, vapors and gases may be introduced into the air-passages, and it is believed that experiments in this line will open up a new field of usefulness and brighten hopes for the helpless sufferers from croup and diphtheria.

A recent distressing case of membranous croup suggested to my mind the propriety of inflating the lungs through a large aspirating needle or curved trochar passed into the trachea, as a substitute for tracheotomy, or to prolong life until that operation could be performed, and it occurred to me also that foreign bodies in the larynx and trachea could be expelled by the same operation. An inflator for such purpose should have two hand-balls so as to force into the lungs a sufficient quantity of air to substitute what would be taken in by the inspiratory act. Expiration would necessarily follow inflation from the elasticity of thoracic walls through an orifice too small to permit inspiration. The internal pressure of a large volume of atmosphere upon the strictured larynx would render it more patulous, and probably detach and expel any false membrane present. The main difficulty would be in preserving the natural rhythm of the respiratory movement. This simple and harmless operation would be justifiable in chloroform poisoning, asphyxia from drowning, and other causes.

The instrument may be made small enough to be carried in the pocket. The instrument I have used is imperfect. It should have a shield to close the mouth and nostrils and a much larger and more elastic air-bulb.

The economic advantages of inflation especially commend it to the poorer classes, and its harmless nature and prompt action suggest the propriety of using it as a substitute for medicinal expectorants in cases of enfeebled digestion and irritable stomach. It is hoped that its use in persons of weak lungs may assist in developing these organs, and perhaps operate as a preventive of

tubercular deposit. It is not urged as a remedy for tuberculosis, as all remedies therefor are justly regarded with suspicion, and the burden of proof in their favor must be submitted to many generations, but the faithful physician should never cease to contend with the malady so long as there is a hope of success.

THE ELECTRICAL TREATMENT OF EXOPHTHALMIC GOITRE.

By A. D. ROCKWELL, A.M., M.D.,

NEW YORK.

In the *New York Medical Record* for Oct. 1879, I detailed four cases of exophthalmic goitre that I had treated by the galvanic current. Two of these cases were complete successes, one approximately so, and one was a failure. To-day I desire to present to this Association some further experiences in the same direction.

Exophthalmic goitre is so comparatively infrequent, and its pathology so imperfectly understood, that its therapeutics has necessarily been more or less uncertain and unsatisfactory. When, therefore, the use of electricity is suggested, the question that first arises in the minds of those who have but little practical experience in methods of electrical treatment, relates to the kind of current, and the details of its application.

In regard to the current, every physiological consideration and all experience point to galvanism as pre-eminently indicated, and yet I must bear testimony to the fact that the faradic current is not altogether useless. The applications, however, must not be local, but general, after the method of general faradization, and, in a certain proportion of cases, where there is anæmia, with marked nervous irritability and physical weakness, benefit will certainly follow, provided, always, that the operator will take sufficient time and trouble to appreciate the various steps of the process, and make his applications practically efficient. The method, though many times fully described, is—unfortunately—seldom made use of properly, or with any degree of thoroughness. In the use of the galvanic current upon which we are mainly to rely, I have obtained good results by placing the cathode over the cilio-spinal centre, above the seventh cervical vertebra, and the anode in the auriculo-maxillary fossa, grad-

ually drawing the anode—after a few moments of stable treatment—along the inner border of the sterno-cleido mastoid muscle, to its lower extremity. The second step in this process consists in removing the anode to the position occupied by the cathode, and placing the latter over the solar plexus, using for a minute or so longer a greatly increased strength of current. In one case, failing, after considerable effort, to accomplish more than a very moderate degree of amelioration of the symptoms, I made use of currents that were rapidly increased and diminished every few seconds (as described in Case No. 2), with very great benefit. Subsequently to this I came across a case published originally by Dr. Ancona in the *Giornale Veneto di Scienze Mediche*, and which had strangely escaped my notice, where an obstinate and severe example of Graves' disease had been cured by direct interruptions of the current, the electrodes being placed on either side, just below the angle of the lower jaw.[1] The cure was accomplished only after the administration of 100 applications. The *causation* of the disease is undoubtedly centric, and, in many cases, structural changes of the sympathetic nerve must underlie all the observed symptoms.

On the other hand, the rapid recoveries that have been known to follow the administration of certain methods of treatment, render it in the highest degree probable that the symptoms may depend as well on functional causes alone.

The onset and course of this disease are so clearly described in our recent text-books, that it seems entirely unnecessary to attempt any detailed description of its numerous symptoms other than will be found in the accompanying cases. One fact, however, in my own experience, that will be noted as the cases are read, strikes me as worthy of a moment's attention, and that is, the frequency with which the disease was met in its incomplete form. By this is meant the cases where some one of the three cardinal symptoms were either absent, or only slightly developed. In three cases,. the eyes were very little, if at all, affected, while the cardiac palpitation and thyroid swelling were very decided. In one case, the pulse was but 88, while the other two symptoms were distinctly present. In every case, however, that has fallen under my observation, the thyroid was more or less enlarged; yet Trousseau and others report cases—which they

[1] British Med. Journal, Dec. 15, 1877.

regard as true examples of Graves' disease—where there was but little, if any, evidence of glandular enlargement.

The first case that I have to present was seen with me by Dr. J. B. Read, of this city, and is the fourth of my reported cases where recovery complete or approximate resulted from the use of electricity.

Case I.—Mrs. E., aged 31, married, and the mother of two children, first observed an appreciable increase in the rapidity of the heart's action in the fall of 1878. About the same time, or soon after, as she was standing before the mirror one morning, her attention was called to an increased fulness about the neck; and, upon passing her hand over the part, she became aware of what she termed a "beating sensation," and a softer feeling. These symptoms increased somewhat rapidly, until they assumed the condition presented when the case came to me in Oct. 1879. At this time the heart was beating at the rate of 120 to 125 per minute, and on exercise, or under excitement, it went up to 150. The thyroid enlargement was marked, though not enormous, while the eyes were quite protuberant and bloodshot. Around the neck, over the thyroid gland, the measurement was fifteen inches. The patient was chlorotic, hysterical, and nervous to the last degree; and it was with the greatest difficulty that she could be induced to submit to the necessary examination and treatment. The spine was exceedingly sensitive to pressure all along its course, and especially between the scapulæ, where firm pressure invariably caused nausea; and on the occasion of her second visit, while running my fingers down the back, and lingering for a moment with a somewhat increased pressure over the more sensitive portion, she immediately rejected her breakfast which had been taken an hour before. It is to be remarked that these evidences of spinal irritation and extreme nervousness became manifest only after the appearance of symptoms indicating exophthalmic goitre. Previous to this time her health had been fair.

The only cause that seemed to bear any relation to the onset of the disease was the one that has been so frequently observed, viz., childbirth. A short time previously she had suffered from a long and tedious confinement, but had gotten up from it apparently quite well. I submitted her to the usual methods of galvanization of the sympathetic and central galvanization, and with some benefit.

The heart's action became somewhat more regular and less frequent; the goitre decreased a little in size, and the spine became less sensitive. Improvement, however, ceased at this point, and the case remaining stationary for nearly a month, I attempted general faradization. I have on several occasions pointed out the fact that general faradization is often most effective in lowering and increasing the strength of a pulse that is weak and rapid as a resultant of nervous irritability.

This effect upon the pulse—as experience shows and electro-physiology teaches—is most frequently observed in exophthalmic goitre after the use of the galvanic current. In this case, however, after galvanization had ceased to be effective, general faradization (from a Kidder faradic machine, which from long experience I have found to be the best apparatus for this form of application) was followed by a still greater diminution in the frequency of the pulse, by decrease in size of the thyroid enlargement, and a very marked improvement in the condition of the eyes. After twenty-five applications of general faradization—administered in the course of two months—the measurement of the neck had decreased by two inches, leaving a slight but firm enlargement in place of the larger and softer tumor that was present at the beginning of treatment. The frequency of the pulse, decreased to about 85 per minute, was not particularly susceptible to sudden fluctuations under excitement or exertion, while the patient had gained immensely in nervous strength and self-control.

Case II.—Miss C. H., aged 29, came to me in September, 1879, with an especially interesting and instructive history, since it illustrates how varying sometimes are the manifestations of a nervous diathesis. During childhood she had suffered long and severely from St. Vitus's dance, which did not entirely disappear until menstruation was established, at the age of fourteen. From the first this function was performed irregularly and painfully until the age of eighteen, when it suddenly ceased, and for some years she was afflicted with periodical hysterical seizures, together with a more or less constant jerking of the head, with a hesitancy of utterance, and an occasional partial loss of consciousness that would seem to have simulated attacks of hystero-epilepsy. At about the age of twenty-one menstruation again appeared, but irregularly, and at the same time her gene-

ral health somewhat improved. In time the courses came on more and more regularly and less painfully, but at the age of twenty-four, after an attack of malarial fever, menstruation failed to reappear. It was at this time that she first began to be annoyed by an excessive palpitation of the heart, and soon her attention was called to a very decided enlargement of the thyroid. This enlargement gradually increased, and when I saw her it was very large, soft, and pulsating, and including the neck, measured sixteen and a quarter inches. The pulse beat at the rate of 110 per minute, while the exophthalmos was very great. After the patient had been subjected to the usual external treatment by the galvanic current, but without any special reference in its direction to the menstrual function—the courses appeared slightly for a day and then ceased, but on timing the pulse, I found that it had decreased in frequency to somewhat less than 100.

The same method was repeated for some three weeks longer, when I had the pleasure of showing the case to Dr. P. B. Porter. At this time the pulse was about 90, while the tumor had decreased only about one inch. The exophthalmos had been only slightly influenced. Deciding to change the method of treatment, I placed one electrode (the anode) directly behind the angle of the lower jaw, pressing back the sterno-cleido mastoid muscle, and the other on the back of the neck, a little to one side of the sixth cervical vertebra. Instead, now, of treating by means of a steady continuous current, I brought into the circuit a simple water rheostat, and by this means, somewhat rapidly, but without shock, increased and decreased the strength of the current through a seance of not more than two or three minutes in duration.

The results of this method of treatment were before long manifested in a further reduction of the pulse, and a gradual diminution of the severity of the other symptoms, until, after twenty-five of these applications, recovery was far advanced. The pulse was 75, the eyes resumed their natural position and appearance, while the neck, although somewhat fuller than normal, measured but thirteen and three-quarter inches, a decrease of two and a half inches.

Case III.—Miss M., aged 22, was seen, with Dr. E. B. Belden, October 18, 1879. Menstruation began at the age of seventeen,

but for two years it was scanty and irregular, after which for a while it appeared normally. At the age of twenty, menstruation again became irregular, and attended also with cramps and considerable pain. At this time the first signs of exophthalmic goitre became manifest, and when I saw her two years subsequently, the three cardinal symptoms of the disease were quite pronounced, although moderate in degree compared to the foregoing. The pulse averaged about 88 per minute. The eyes were slightly protuberant, while the neck measurement over the enlarged gland was fifteen inches. Opportunity was afforded of seeing this patient but a comparatively short time, but in the few applications that were given, the circumference of the neck over the gland was reduced to fourteen and a quarter inches. The pulse, however, became markedly modified, decreasing to the normal standard of 72 per minute. As I am recording this case the patient again calls at my office. It is now five months since the treatment was discontinued, and the pulse is found to be 72, the same as recorded at that time.

The neck is found to measure fourteen and a half inches, showing an increase during the interval, although smaller by half an inch than it was originally.

An interesting fact connected with this case is its relation to the menstrual function. The disease first began to show itself as menstruation became scanty and irregular. Two years subsequently the slight diminution in the goitre and decrease in the frequency of the pulse were simultaneous with a more regular and better performance of the menstrual function. After the cessation of treatment she remained better until a short time before the last visit to which I have just alluded, when there was a retention of the menses, followed by some increase in the size of the thyroid and an increased action of the heart. Through the administration of remedies, menstruation was established in about a week, resulting in a modification of the circulation.

Case IV.—Mrs. C. was seen with Dr. Frank Wilmuth, of East Orange, N. J. The enlargement of the thyroid was considerable, but the eyes were not at all affected. The pulse was rapid, beating ordinarily at 125 a minute, but reaching 160 when under excitement. When asleep, it was but 95. The patient was the mother of two children, and although her last labor, four years ago, was somewhat severe, it could hardly have entered as a fac-

tor in the causation of the disease, since the first evidence of cardiac disturbance appeared three years subsequently. The symptoms were coincident with exhaustion following hard work in house cleaning. The patient submitted to considerable treatment, but coming so far her visits were necessarily rather infrequent. It is by no means clear to my mind that the necessity of riding so far, both before and after each visit, did not interfere somewhat with the efficiency of the treatment. At all events, no impression was made upon the disease other than some diminution in the rapidity of the pulse.

CASE V.—Miss ——, aged 34, came to me but a few weeks ago from Dr. James Collard, of Westfield, Mass., with a goitre of considerable size, but with very little protuberance of the eyes. The pulse was 112, menstruation was normal, but the patient was extremely nervous and depressed. Her mother has a very large goitre, which began to develop thirty years ago. A brother and sister died of hasty consumption, and four years ago the patient herself had a slight hemorrhage.

The pulse was found to intermit some eight times a minute. I saw the patient but three weeks, when she was compelled to leave the city, but with the intention of continuing the same course elsewhere. Under the short treatment that she received the pulse lost its intermittent character and became entirely regular. At the same time the patient became much less nervous. Aside from this, little was accomplished except some diminution in the frequency of the pulse and a very slight decrease in the size of the goitre. The case is, however, especially worthy of record because of the very interesting temporary results that followed various applications. On counting the pulse during the first galvanic application, no intermittence was detected. A few moments after the removal of the electrodes it intermitted as usual eight beats a minute. The same results followed a second application, with the exception that after the removal of the electrodes the pulse began to intermit but three or four times a minute, and after the fourth application it became permanently rhythmical. At one time during the treatment the pulse fell to sixty-seven, and stayed there for some time.

ON THE USE OF SULPHUR AND ITS COMPOUNDS IN DISEASES OF THE SKIN.

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Fifty years ago such a paper as the present one would have seemed superfluous, for sulphur was universally recognized as "good for diseases of the skin," very little attempt being then made to separate and differentiate the maladies of this organ, which are now so clearly distinguished. It is not very long since a lecturer, with more art than knowledge, said that there were three classes of skin diseases: the first, sulphur would cure; the second, mercury would cure, and the third, the devil himself could not cure.

Modern dermatology has made vast advances since those days, and this branch, so far from being the *terra incognita*, has become one of the most, if not the most, developed branch of medicine; a larger number of distinct diseases are perfectly recognized as affecting the skin than any other organ, their differences clearly established, and the therapeutics of this branch will yield the palm to that of no other department.

There are, however, many difficulties inherent in the study of diseases of the skin, which have in time past prevented the general practitioner from acquiring a perfect knowledge of this branch; chief among these has been the difficulty of observing cases in sufficient numbers to become familiar with the appearances presented. This, together with the vastness of the subject, must still be an obstacle before many, but to those who will search for and improve the opportunities offered by the large classes of skin patients in the dispensaries of the cities, much of the apparent difficulty in recognizing and classifying diseases of the skin would pass away.

This much is premised, because in my attempt to indicate concisely the true value of sulphur in diseases of the skin, I

shall be obliged to be very brief in allusion to diseases, and the whole value of my remarks, as applied to practice, will of course depend wholly upon accuracy of diagnosis in individual cases. To prescribe sulphur or arsenic simply because the skin is diseased, would be as irrational as to appropriate any other remedies to any special organ of the body, as, for instance, to give digitalis whenever the heart was affected. Four years ago the writer had the pleasure of presenting before this Association a study on the use and value of arsenic in diseases of the skin, in which he endeavored to clear up the subject, by defining clearly what arsenic would accomplish in certain diseases, and in what affections it was useless or harmful. The aim of the present study is similar in regard to sulphur and its compounds, which, while of much service if rightly applied, are worse than useless if wrongly employed.

In studying the subject we will, for clearness, separate the internal from the external use of the remedies considered, and will speak of each in turn. We have also to consider the following points: sulphur alone; next, as combined with other drugs; then of its compounds; and lastly, of mineral waters containing sulphur.

Sulphur is one of the oldest remedies used in medicine, and it was early employed in diseases of the skin. The reason of the great reputation of sulphur in this class of affections was undoubtedly because of the remarkable results which followed its use in scabies; and as the real nature of the disease and its cause was unknown, it was readily supposed that it should be equally effective in all skin affections; and it was also supposed that an agent which acted so well externally, should be of further assistance when administered internally. Numbers of books have, therefore, been written upon the external and internal use of this remedy, and of course vast claims have been made for it which, in the light of to-day, appear ridiculous. But we will find that sulphur and its compounds still play an important part in cutaneous therapeutics when rightly and intelligently used.

Pure sulphur is seldom given alone internally, and is not generally thought to have much, if any effect, in diseases of the skin; its internal administration is commonly confined to its use as a laxative. I can, however, speak very highly of it in eczema about the anus and genital organs, especially when this is—as is most frequently the case—associated with constipated

bowels and piles. I have always employed it in connection with an equal part of the bitartrate of potassa, the precipitated sulphur being preferred. Of this, one to two heaping teaspoonfuls are given at night, stirred up with a teaspoonful or so of water; the addition of a syrup impairs its value. The benefit from this in eczema of the anus I can attest by a not inconsiderable number of cases. I have no suggestion as to the *rationale* of its action, except that it acts as a liver stimulant; nor have I much experience with it in any other disease of the skin than eczema. I have given it repeatedly when this eruption was situated elsewhere than on the anus; but as many other remedies were used, I cannot be certain as to its effects.

The lowest combination of sulphur with oxygen, sulphurous acid, SO_2, is seldom used internally, but will be spoken of later in regard to its external uses.

Sulphide of calcium, CaS, has recently attained a considerable reputation in the treatment of skin lesions attended with suppuration, and to its value I wish to bear strong witness, as I have notes of over one hundred cases in which I have used it. The first suggestion of its use was in acne, and a number of observers have testified to its value in certain cases. I have administered it to sixty-nine patients with acne; sometimes alone, more often, perhaps, combined with local measures; but even then I have been able to test its efficacy, because it was used intermittently, and the changes could be thus readily observed. It certainly will not cure every case of acne, and on many it seems to have little, if any, effect. It is chiefly serviceable in those cases which have considerable of a pustular element, either as the acute small suppurating pimples of youth, or the larger masses of acne indurata; it is of but little service in rosaceous acne.

The somewhat similar affection—hordeolum—finds in the sulphide of calcium its best remedy, and in a number of cases I have seen the styes wither at once under it, and cease to be produced. Of its great value in this lesion, I can bear personal testimony, having taken it myself on a number of occasions, and with almost uniform success. In abscess of the external ear it has been highly praised.

Sulphide of calcium is also of decided value in furunculosis, not only in aborting the boils present or forming, but in checking the suppuration from those which have already discharged; this medicine also I believe remedies the habit or state of the

system, so that, in place of a succession of boils, as expected, a single one or two has completed the attack.

The effect is also striking in anthrax, and I have more than once seen a large mass of inflamed tissue, which would surely have suppurated, subside under its influence; and I have also seen a carbuncle which already exhibited points of pus, end in a marvellously short time by this means. I have given it in twenty cases of biles and carbuncles, generally, if not always, alone. It is also of great service in the boil-like masses—often of some size—which appear on the heads of even very small children during the summer. I could give a number of cases where this process was thus checked almost at once.

True, non-parasitic sycosis has in several instances been greatly benefited by sulphide of calcium internally, in my hands, though it is capable of carrying the case to a certain distance, and no further.

I have also used this remedy in a number of cases of suppurating bubo during the past year, and with striking results. My friend, Dr. Otis, has also recently reported good results in similar cases.

There is not a little difference in the different specimens of the sulphide of calcium, and not infrequently the drug will appear inert. When made into fresh pills, they should have a decided odor of sulphuretted hydrogen, and should leave a taste of the same in the mouth; they may also be followed by slight eructations of the same, and the stools should have the same odor.

The dose which I have most usually employed is one-quarter grain, four times daily on an empty stomach. I have generally used the pills, freshly made, with a small amount of the extract of gentian; but the gelatin coated granules are quite reliable. In children, I have commonly given it in suspension in water with a little glycerine, and have found it equally effective; the dose has been smaller, often a tenth of a grain to infants, four or five times daily. I have also given, with good effect, the smaller doses, as one-tenth of a grain, every two or three hours.

Sulphuret of potassa is also given internally, and probably will be found effective in the same conditions as those in which the sulphide of calcium is of service; but of this I have no personal experience.

That it is the sulphur which exercises the beneficial effect in

these cases, there can be very little, if any, doubt, inasmuch as other preparations of sulphur have been used with great advantage in the treatment of boils. These are the sulphite and hyposulphite of soda, and sulphuric acid. The former of these preparations I used quite extensively some years ago, and reported very favorably upon it as the best remedy with which I was then acquainted. Sulphuric acid is also well recognized as of service in this condition, and need not be dwelt upon here.

It is also hardly necessary to enter upon the consideration of the many agents used in medicine in which sulphur enters as a secondary constituent, in the form of sulphuric acid, but as they are among the most important remedies, they should be mentioned; such as the sulphates of atropia, copper, iron, magnesia, mercury, morphia, quinia, soda, strychnia, and zinc. It must be remembered that sulphur is a large constituent of the human frame, and not an unimportant one, and that the reason why the sulphates are among the best forms in which to employ the various other agents may be, and probably is, because they are already combined with one of the elements of the body. As an example of a wonderfully valuable combination of the compounds of sulphur in diseases of the skin, may be mentioned that known to many as Startin's mixture, with the following formula:—

℞. Magnesiæ sulphat. ℥j;
Ferri sulphat. ʒj;
Acidi sulphurici dil. ʒij;
Tinct. gent. ℥j;
Aquæ, ℥iij.—M.
Teaspoonful after eating.

This is most potent in reducing the cutaneous congestion in such conditions as erythema multiforme, erythematous eczema, and urticaria, and is constantly employed in my private and public practice. The effective agent is certainly not the magnesia alone, for if given singly or in other forms the results are not the same: nor is it the iron, or the gentian, but it is the *combination*, and I cannot doubt that the sulphur element plays a very important part. The confirmation of the internal value of sulphur is further found in the mineral waters which are impregnated with sulphuretted hydrogen, known as sulphur waters, such as those of Richfield, Sharon, Avon, the White Sulphur of Virginia, and many others in this country and abroad. All are familiar with the popular views both among the laity

and the profession, in regard to the efficacy of these waters in diseases of the skin. There is very generally some basis for popular opinion, and in this instance it is not very difficult to find. The error in it is in the want of discrimination of proper cases, which must ever obtain in such medical matters. These sulphur waters undoubtedly first obtained much of their reputation from their use externally in parasitic diseases, animal and vegetable, as will be mentioned later.

But these sulphur waters have also some power upon the system used internally, and, beyond question, are of a certain value used thus in some skin diseases: the waters act upon the liver and intestines, and are undoubtedly of service in the rheumatic and gouty habit. I have seen a certain amount of good from them in chronic eczema and acne, and have personally experienced the benefit of the White Sulphur taken internally alone in urticaria. But multitudes of patients with eczema, acne, and other skin affections go to these springs without benefit, and the many instances of psoriasis which I have seen who had previously been to these springs without permanent benefit, leads me to doubt their power over this disease.

I greatly regret that I cannot speak more definitely in regard to the internal use of these sulphurous mineral waters in diseases of the skin, for while I believe that as quickeners of the emunctories they are of some value, I have seen so many individuals who have failed of cure at them, that I cannot but think that the mode of their use has been faulty. Unfortunately, we have very little reliable information in regard to the actual powers of our mineral springs, for little trust can be placed upon the matter printed in the circulars and pamphlets furnished by the hotels, and we have almost no independent and well-weighed testimony, based on large experience. Even physicians, resident at springs both in this country and abroad, become prejudiced to such a degree as to hardly see any value in other springs save their own, and to attribute everything to the spring in which they have had experience. There is great need for the collection of reliable data on a scale sufficiently large to give deductions therefrom, which shall be of value. The writer has many a record, and seeks daily to gather such from practice, but the reports are yet too conflicting to allow of any conclusions to be formulated. He will be greatly pleased to receive any assistance possible in this direction, and will be glad to learn of positive

proven facts of value in regard to these matters, as he intends to report on the matter when sufficient data are collected.

The external use of sulphur and its compounds is of more definite interest than the internal, because the facts are more conclusively demonstrable. First and chiefest of all must be placed the treatment of scabies, which, as previously remarked, has probably been the means of giving sulphur much of its reputation as curative of diseases of the skin. The itch is undoubtedly one of the diseases which is becoming extinct with advancing civilization, although in time past it formed a not inconsiderable share of cases with skin disease. It is to-day very much more frequent in some countries than in others. Thus, at the clinic of Prof. Hebra, in Vienna, one sees cases almost, if not quite daily, and in Paris it is so common that those affected with it are not admitted to the great Hôpital St. Louis, but merely receive a card which passes them through the rapid cure which will be described later on. In Glasgow, scabies formed one-quarter of the ten thousand skin patients in public practice. In this country, on the other hand, it is very uncommon, forming only between two or three per cent. of all the cases of general skin disease which I have seen in public practice. During our late war, however, the disease was much more prevalent, and good observers consider that the "army itch" was only this disease. It is also sometimes common in public institutions.

It is therefore principally as a local agent that sulphur has its chief reputation, and it is thus that it is often employed in general skin disease, with the hope or impression that in some way sulphur is "good for the skin," without any definite idea of what is to be accomplished.

Now, sulphur is an irritant to the skin, whether it is applied to abraded surfaces or rubbed well into the healthy skin, and this must ever be borne in mind when it is used. It is of value, therefore, only when a stimulant is required, or when its parasitic action is desired, and is consequently of service in comparatively few diseases of the skin. Foremost among these still stands scabies, for which it may almost be called a specific, for it certainly can, singly and alone, cure this eruption by destroying the cause—the itch insect.

The treatment of scabies has been now reduced to a very simple matter in most cases, and depends upon the very thorough

application of the parasiticide to every place occupied by the burrowing acarus. The plan generally adopted is that of Hardy, of Paris, which consists in soaping the body well for half an hour, following this with a warm bath for an hour, and then half an hour of thorough inunction. The sulphur ointment of the Pharmacopœia, which is composed of one part of sulphur to two of simple ointment, is far too strong for most skins, and is very apt to excite an artificial inflammation which may readily be mistaken for a further eruption of scabies. It is well, therefore, not to have it used too long or too energetically on delicate skins; one thorough course, such as that above described, suffices for the cure of many cases; but it is well always to wait a few days to observe whether the itching returns, when the course may be repeated. I seldom, however, use the officinal ointment, but prefer to have one made of a strength suited to the individual case, generally about two drachms to the ounce, adding a drachm or two of storax, which is a parasiticide of very considerable value.

Precipitated sulphur is of no little value in acne, and many of the best applications used for this eruption depend largely for their efficacy upon sulphur. Such, for instance, as the following:—

℞. Sulph. precipitat. ʒj;
Etheris sulphurici, ʒiv;
Spts. vini rectif. ℥iijss.—M.

also,

℞. Sulph. precip. ʒj;
Tinct. camphoræ, ʒij;
Glycerini, ʒij;
Aquæ rosæ, ℥iijss.—M.

The compounds of sulphur will also be found very efficient in acne, as, for instance, the hypo-chloride of sulphur, so much extolled by English physicians, used in the strength of one or two drachms to the ounce of the ointment, well rubbed into the face at night. Iodide of sulphur, used in the same way, in perhaps a little less strength, is also effective.

But all these applications are stimulating, and care must be taken not to carry this plan of treatment too far, for while we can by well-regulated stimulation urge the skin to healthy action, it is very easy to overstep the bounds, and we can have the harsh, irritated skin, which may be even more annoying to the patient than the eruption which we seek to remove.

Another compound of sulphur is also of very great service in acne, and this is found in a formula which I have mentioned already several times in print. This preparation is only mildly stimulating, and is one which can often be used with advantage even in quite inflamed faces. It is composed thus:—

℞. Potass. sulphuret.,
Zinci sulphat., āā ʒj ;
Aquæ rosæ, ℥iv.—M.

The ingredients are each dissolved in one half the water, forming clear solutions; they are then mixed, and a white precipitate takes place, which is to be shaken up and allowed to dry on the face.

In speaking of the value of local applications in such eruptions as acne, etc., it will be understood, of course, that internal, dietetic, and hygienic measures are to be used as well; these are of course foreign to the immediate purpose of this paper, which is only to show the importance of sulphur as an agent in dermatological practice, if rightly used.

Sulphur and its compounds have a not inconsiderable value in the treatment of the vegetable as well as animal parasitic eruptions. Sulphur will destroy the life of the parasite in favus, ringworm, and tinea versicolor, and may be employed with success in several ways. My preference is usually for sulphurous acid, as I have urged on several previous occasions. The mistake in the ordinary methods of using sulphurous acid is, I think, twofold: first, it is generally recommended to be used diluted with one or several parts of water. This I consider to be entirely unnecessary, and worse than useless, as it diminishes the efficacy of the remedy. Pure, *fresh*, sulphurous acid I have not found too irritating even to the skins of females and children, to whom I constantly advise it. The reason for the common advice to dilute it rests, I think, upon the second error which generally occurs, namely, that the acid is not perfectly fresh but has undergone a decomposition, as it has a very great affinity for oxygen, whereby it is changed from sulphurous acid (SO_2) to *sulphuric* acid (SO_3), which latter is of course irritating to diseased and delicate skins. To avoid this as far as possible, I always order a fresh, unopened package of sulphurous acid, as it comes from the manufacturers, in half pint and pint bottles, and have the patient fill a small bottle, say one containing an ounce, from this, and use from the smaller bottle, keeping the

large one tightly corked; when this direction is followed only good results are seen.

Sulphite and hyposulphite of soda, in solution, two to four drachms to the ounce, will also serve tolerably efficiently to remove these vegetable parasitic eruptions, but are of less value than the pure sulphurous acid, upon which their virtues depend. We may also use the sulphurous acid very efficiently in the way of the well-known sulphur vapor-bath, which is made by burning sulphur in a closed box in which steam is also confined. This will remove the tinea versicolor, or liver-spots of older writers, on the chest and back, quicker than almost any other measure, a very few baths serving to quite free the skin from it. But this eruption has a very great tendency to relapse, because the destruction of the parasite may not have gone far enough to reach every spore, and a single mass of the vegetable growth remaining in or around a hair follicle may be the means of propagating the disease anew. It is well, therefore, to continue treatment for some time after the apparent removal of the eruption.

A word may here be added in regard to the use of sulphur vapor baths in other diseases of the skin, for it is very common for patients to try them, and for physicians to recommend them indiscriminately in all cutaneous diseases. It may at once be stated that they should not be so used, and I have seen far more persons who have tried them either ineffectively or to their harm, than I have seen those who are benefited by them—yes, two to one. It may be almost too trite a remark to make here, that the value of remedies in skin diseases depends wholly on accuracy of diagnosis and applicability of the remedy, but it is a point which is hardly enough borne in mind by the profession at large, and no better exemplification of this can be found than in the reckless way in which sulphur baths are advised when the skin is diseased, unless it be the wholesale administration of arsenic under the same conditions. Sulphur vapor baths are of service in comparatively few diseases of the skin. In the vegetable parasitic diseases as mentioned, they are useful, except, of course, for eruptions on the face and scalp, where they cannot be applied. They are also of value in scabies, though inferior to other means. Psoriasis is benefited by them, but cannot be cured by this means, and not infrequently they will hardly affect the eruption at all.

Sulphur vapor baths are, as a rule, inapplicable in eczema,

except, perhaps, in some very chronic cases, where the disease is localized to a few patches, and the skin is hard and strong. In the vast majority of cases of eczema the sulphur vapor bath irritates the skin and aggravates the eruption, or causes new disease. It is wholly inapplicable in such eruptions as urticaria, herpes, pemphigus, and the like, together with the large classes of hypertrophies, atrophies, and new formations of skin.

In regard to the use of the sulphur vapor bath in syphilis there is some difference of opinion, but there can be no doubt that it cannot cure the disease, though, by increasing the emunctory action of the skin, it may make the mercurial course to be better borne, and more effective in certain cases which have long resisted treatment.

Time and space forbid entering more largely into the subject, but sufficient has been said to call attention to the wide field of usefulness which sulphur plays in the treatment of diseases of the skin, and yet to show that it is not a panacea for this class of affections. These remedies are to be employed intelligently, like any others, and when so used, may generally be relied on in the appropriate diseases.

Sulphur is of value internally, as it acts upon the liver and intestinal canal in cases of eczema of the anus, and in many cases of other skin diseases which are accompanied with piles. In its compounds it is of value in diseases in which the production of pus is a feature, as in the use of sulphide of calcium, sulphuric acid, and hyposulphite of soda in boils, acne, carbuncles, etc.

Locally, sulphur is mainly useful in the treatment of the parasitic diseases, animal and vegetable, and it is also of service in acne. It is a local *stimulant*, and, if incautiously used, gives rise to *irritant* action, and is entirely inappropriate in acute inflammatory skin affections, and useless in hypertrophies, atrophies, and new formations. Sulphurous vapor baths and mineral waters containing sulphur should not be used indiscriminately in skin affections, but are of value in parasitic diseases, and also in those in which a rheumatic element is strongly pronounced.

DIET-CURE OF RHEUMATISM.

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THE pathology of rheumatism has, the last thirty-five years, undergone a striking revolution, and its treatment one not less remarkable. To-day, the *rôle* of the solids is overshadowed by that of the fluids; the change of structure by the fermentation of the blood. The fever and inflammation are held to be not idiopathic but specific, and, as in the tuberculous and scrofulous dyscrasies, not active, but irritative, and hence amenable, not to depressing, but to sustaining medication.

Meanwhile, many other diseases, attended with fever and inflammation, have been traced to the blood, and ranged under the same head.

From this standpoint, there cannot be a doubt that the old doctrine, insomuch as it demanded harsh and sanguinary measures, did a deal of harm. Only the more robust were able to withstand the disease and the treatment. These measures—depletion, purgation, salivation, and vesication—being supplanted by anodynes, diuretics, alkalies, and fomentations, there was a great gain. The natural forces were allowed a chance to assert their sovereignty, and right the system; and, what is more, were aided in the work by the agencies invoked to allay the pain, and eliminate the acid element from the blood. And yet, strange to say, the old pathology still survives, and casts its baleful shadow over the new. There is the same *penchant* for potent remedies and heroic treatment, such as will promptly suppress the more violent symptoms. The activity of the circulation, it is thought, must be reduced, and the irritability of the nerves subdued, at all hazards. A simple, harmless medicine like salicin, that displays such wonderful power in acute attacks of articular rheumatism, is supplanted by dangerous chemicals that produce a more striking and profound impression. Neither the

vigor of the assault on the stronghold of the enemy has been slackened, nor any vulnerable point neglected. The old pathologists hoped to subdue the fever and inflammation by reducing the volume of the blood, and the new anticipate the same result by repressing the irritability of the nerves. The field of battle has been changed, and other tactics adopted; and yet, as hitherto, the invader maintains his foothold on the soil, and ever and anon renews the contest.

In transferring the pathological seat of rheumatism from the joints to the blood, there was a great advance in the right direction; only in dismissing the solids from further consideration, the other fluids, as well as the blood, should have been taken into account. The tissues are no more dependent upon the blood than the blood upon the digestion. The gastro-intestinal secretions being depraved, perfect assimilation is impossible. Besides, the quality of the food is an important factor, for all the elements of nutrition must be supplied, and that, too, in the exact proportion needed by the economy.

As the blood is being constantly renewed by the food, it is evident that a permanent change in its quality for the better must come through dietetic and hygienic regulations. Drugs, like colchicum, alkalies, salicin, salicylic acid, and iodide of potassium, may eliminate or neutralize the rheumatic element, but cannot prevent its re-formation. The use of gruels, broths, and vegetables, and the disuse of articles taxing the powers of the stomach, may lessen the supply of nutritive materials, but cannot alter the character of the chyle. And hence, while the digestion shall continue defective, the fermentable product will be furnished with each meal. A profound impression upon the bowels, kidneys, and skin, may suppress the symptoms, and afford relief; but should the primary cause remain untouched, the old excitement would continue to return, until the pain and tenderness became chronic and intractable.

Inasmuch as the stomach and bowels have, in most cases, been a long time disordered by the quantity and quality of the food, it would be necessary to restore their capacity for active work, before any plan of diet could induce any decided improvement. And, then, as the digestion is due to certain secretions—the solvents of the food—it needs no argument to show that these secretions must become normal before they can prepare normal chyle.

Therefore, the problem presented in the treatment of rheumatism, aside from certain general remedies at the outset of an acute attack, is to put the stomach and bowels in a healthy condition, and to give only such articles of food as admit of complete digestion and assimilation. Thus, the rheumatic element will not be furnished to the blood, the fermentation will not be excited, and the fever and inflammation will not return, unless the dyscrasy be an heirloom—a legacy from one's ancestors—or implanted on some other irremediable vice of the system.

When, from my ill success in chronic cases of rheumatism, I had come to the conclusion that the primary seat of morbid action is in the chylopoietic viscera, I attempted, while giving certain specific remedies, to eliminate the products of fermentation by the skin, bowels, and kidneys, to correct the gastro-intestinal secretions, and improve the quality of the chyle. To do this, I prescribed laxatives, with or without calomel, as the case might be, until the secretions were corrected, and allowed simple, unirritating articles of food only. I avoided the tonic plan, and made the patient's strength to wait upon a more complete digestion and assimilation. I was forced to this course, as alcohol, iron, meat-broths, and everything else of a tonic, bracing nature, such as are used in other cases of convalescence, seemed to aggravate the disease, and renew the fermentation. Consequently, as the bloodless, nerveless patient gained little nutriment from gruels and farinaceous articles, and little strength from bitters and quinine, the recovery was always slow, the tendency to relapse always present, and a fresh attack always imminent. Since the use of milk with lime-water, however, as almost the sole article of diet in febrile affections, the void in alimentation and medication has been filled, and I have, while eliminating the uric acid from the system, been enabled to prevent its re-formation and supply the blood with all the elements of nutrition at one and the same time. The milk being unstimulating and very digestible, the gastro-duodenal mucous membrane returned to a healthy state, so that perfect chyle was elaborated; and, containing all the elements of nutrition, the assimilation regained its activity, so that the uric acid was no longer generated in excess. A healthful nutrition being thus established, and the blood and nerve forces sustained by a diet that is both food and medicine, the progress to recovery became steady and uninterrupted. What is more, the milk-diet not

only obviated the tendency to chronic stiffness of the joints and muscles, but, also, the tendency to a recurrence of the disease.

At the present time, with salicin to aid the alkalies, and vegetable acids in eliminating the *materies morbi* from the system, and milk to restore the digestion and assimilation, there seems to be no lack of means to secure a prompt recovery from acute or chronic rheumatism, and a long release from future attacks. In acute cases, I give calomel as a purgative, morphia as an anodyne, Rochelle salt in lemonade as a laxative and diuretic, and from ninety to a hundred grains of salicin daily until the fever and pain abate. This while, the patient takes six tablespoonfuls of milk, with one tablespoonful of lime-water, every three hours. That the gastro-duodenal mucous membrane may regain its healthy state, and the digestion be fully restored, every other article of diet must be rigidly excluded.

Thus treated, the pain in three or four days leaves the joints, although the limbs still continue as swollen and motionless as at first. Now, all that remains is to regain the nervous power and the muscular force. This may be accomplished by gentle means, without any fear of relighting the disease; for the enemy has been routed from the system, and nothing remains but to repair the damage he has inflicted.

When the above remedies, reinforced by quinine, have been used, as the occasion may demand, for some days; and when the milk, reinforced first by farinaceous articles, and later by fresh meat at dinner, has been taken for some months, I have seen the rheumatic element seemingly eradicated; at least there has been a long respite to persons who had previously been constant or frequent sufferers.

E. B. had articular rheumatism when nine years of age. It began in the summer, and lasted three months. Eight years later it seized her in the winter, imprisoned her two months in her room, and left her weak, anæmic, and crippled. Her recovery was completed by the warm weather and country air. In the latter attack I was her attendant, and met with the average success.

The 24th of October, 1877, she was confined with her third child, and the 6th of January following was attacked with a high fever and excruciating pain in the shoulder joints. Her sufferings were so severe, that morphia failed to afford her any

relief the first forty-eight hours. During this time she took Rochelle salt freely, and nearly two hundred grains of salicin.

℞. Salicin. ʒiijss;
Syr. acaciæ, q. s.
Ut fiant pil. L.

The pills were put up in capsules, and two given every two hours. The pain becoming more tolerable, and not forbidding the use of a bed-pan, I gave her a purgative dose of calomel. Subsequently, I reduced the salt and salicin, and eventually supplanted them with quinia and cinchonia. The pain and swelling in the shoulders rapidly extended to the other joints; but, what is peculiar, all the affected parts improved simultaneously, and none were attacked a second time. In less than a week there was neither fever nor pain; but the limbs were powerless and the joints swollen. In less than two weeks she was out of bed and hobbling about the room without inconvenience, further than that occasioned by her clumsiness. All this while she lived on milk exclusively; and, thereafter, for the eleven months during which she continued to nurse the baby, she made it the main article of her diet. In less than three weeks the recovery was complete—a marked contrast to the previous attack in which salicin and milk were not employed.

Mrs. B. is now nursing her fourth child, ten months old. She has taken three or four glassfuls of milk daily since its birth, is hardy and vigorous; weighs 127 pounds; does a good deal of hard work besides taking care of the baby, and has had no return of her old complaint. This is a great change from her former condition. Then her weight was never above 97 pounds; and lactation so reduced her as to necessitate the weaning of her first child when a few months old.

Mr. A., æt. 78, has had the rheumatism hanging about him since his third year, when he had an acute attack; and he has, at various times, been confined to the house for weeks together. When I first saw him, November 3, 1879, his hands were swollen and useless, and his muscles and joints stiff and painful. Besides, he was affected with hypertrophy and valvular disease of the heart, enlargement of the prostate gland, frequent and difficult urination, and gastric and intestinal disorders. His food, which he relished and partook of liberally, had consisted of meat, bread, and potatoes almost exclusively.

Proceeding upon the plan indicated above, this patient was able on the 18th of January, 1880, though he lived on a third story flat, and the route of the cars was two blocks distant from my house, to call at the office. At his second visit, the 22d of March following, when he came to consult me about certain dyspeptic symptoms which had begun to trouble him again, I found that he had, the previous two months, been out of doors whenever the weather permitted, and had been relieved, except a dull pain in the shoulders, of the rheumatic feelings. He had free use of his hands, and his health was far better than is common at his time of life. In this case the restriction of the dietary to milk, farinaceous articles, and acid fruits, except at dinner, when meat was allowed in moderation, neither impaired muscular power nor depressed nervous energy, even at his advanced age; but, on the contrary, so quickened the digestion and assimilation, renewed the secretions and excretions, and stimulated the nerves and arteries, that this old, decrepid man resumed active exercise in the open air, and passed his days and nights in comparative comfort. Certainly milk, qualified by lime, must be highly digestible and nutritious; even more so than all other articles combined, if it be capable of sustaining and strengthening the human frame after its vital mechanism has been nearly worn out by time and disease.

H. O., ætat. 15, came under my care March, 1877. In her fifth year she had had intermittent fever, which, when eventually subdued, left her so weak and bloodless, that anasarca supervened. From this poverty of the blood, her recovery, as she grew up, was imperfect, her face remaining pale, her blood thin, her nutrition bad, her flesh flabby, and her vigor deficient; yet she ate heartily, consuming an unusual amount of animal food.

Two years previous to my attendance, articular rheumatism showed itself, and, thereafter, continued to recur at longer or shorter intervals, with general excitement, and local pain and swelling. At all times there was stiffness of one or more joints, particularly of the ankles, and an imminence of a fresh relighting of the inflammatory symptoms. At one of these periodic exacerbations, that had recurred so frequently the previous winter as to confine her to the house most of the time, I saw her whilst in attendance upon her uncle. Her stomach and

bowels were disordered, her strength and flesh reduced, and her digestion, assimilation, secretions, and excretions much in fault.

She had been ordered a great variety of specific remedies, those supposed to be effective in the elimination of the morbific matter from the system, but allowed to follow her inclinations in the choice of her food, which was always rich and nutritious, and often oppressive and indigestible. Hence, as fancy and appetite were the only guides to the kind of material furnished to the blood, the fermentation went on, and the inflammation, every now and then, lighted its fires anew.

At the start, I gave a purgative dose of calomel, and ordered an exclusive diet of milk with lime-water. The mercurial having been repeated, in two or three days Rochelle salt and lemonade were prescribed for the double purpose of a laxative and a diuretic. In a few days, when the excitement had somewhat abated, crackers, bread, potatoes, and clam-broth were added to the milk ; but meat and meat-broths were forbidden until the recovery should be well assured.

Soon a change for the better was noticeable. The digestion became perfect, the movements natural, the urine clear, and the assimilation active. As the nutritive functions regained their sway, the pain left the joints, and the strength returned.

For some months after recovery, her dietary consisted of milk, bread, oatmeal, or wheaten grits for breakfast; fresh meat, bread, potatoes, and fruit for dinner; and milk, bread, crackers, and gingerbread for supper. Any unusual appetite was appeased by milk in the forenoon and in the evening. Acid fruits were allowed at any time of the day.

At this date—May, 1880—no relapse has occurred, not even rheumatic stiffness of the muscles, and her health is perfect in every particular, although she has the past two years paid little or no regard to dietetic rules.

It would seem in this case as though a steady use of milk and vegetables had, by cutting off the supply of the rheumatic elements, revolutionized the system, removed the uric acid diathesis, and given a fresh start to the vital forces.

THE STRONG GALVANIC CURRENT IN THE TREATMENT OF SCIATICA.

THE RESULTS IN THIRTY-TWO CASES.

By V. P. GIBNEY, A.M., M.D.,

NEW YORK.

Of thirty-two cases of sciatica treated by the strong galvanic current in the out-door department of the Hospital for the Ruptured and Crippled, it is my pleasure to present the following analysis:—

Twenty-four were relieved of pain immediately after the first application, three were partially relieved, and five obtained little or no relief. The relief thus immediately obtained was temporary; the paroxysms, as a rule, returning within twelve hours, yet with less severity and shorter duration. In many instances the applications were repeated daily, and the paroxysms were soon broken up. To illustrate the speediness and permanency of cure in recently acute cases, the following furnishes an admirable example:—

Case XX.[1]—Mrs. M., æt. 50, applied for relief April 8, 1879. She had been suffering most acutely for three days with pain in the distribution of the sciatic nerve right side, and was unable to assign any cause for the attack. It was with great difficulty that she could walk at all, as the pain was aggravated by movement of the limb. If she attempted to stoop, a paroxysm was excited. The patient was well developed, and seemed to be in a fair condition of health. Treatment was not begun until the day following, the 9th, and then as strong a current as she could endure was employed for five minutes. There was imme-

[1] The first fifteen of the thirty-two cases are reported in detail in a paper read by the author, before the New York Academy of Medicine, February 6, 1879, and published in the American Practitioner, March and April, 1879.

diate and complete relief from the pain. She had four more applications on successive days, and never had any more pain after the third.

March 30, 1880.—Calls to-day, having just returned from San Francisco, Cal., to report her cure, and to express her gratitude to the hospital in a substantial manner. She states that she left New York very soon after the date of the last application of the current, in April, 1879; that she has been actively engaged during the year standing and walking all the day, and never in all this interval has she experienced the slightest twinge of pain or any lameness whatever. The relief was permanent, and now no evidences of sciatica can be found.

Other cases I could easily present wherein the relief has been quite as marked, yet the above will suffice to show how valuable an agent we have in the strong current if employed early in neuralgia.

Only twenty of the whole number were uncomplicated, and sixteen of this twenty were permanently relieved; in fact, were completely cured, while three could not be found. The presumption is, however, that these three were cured, inasmuch as there was no pain at the date of last application, and inasmuch as they have failed to return. One did not get permanent relief. I have made very diligent efforts to trace out the cases at long periods after treatment has been suspended. The efforts have been in a measure successful. Nine cases were found wherein from twelve to eighteen months had elapsed between the suspension of treatment and the last examination; five with an interval of from ten to twelve months; two with eight to ten months interval, etc. The shortest interval was six weeks. Eight could not be found. These include the complicated and uncomplicated cases. Sixteen of those traced have had no relapse, and can with safety be pronounced permanently cured; four had no permanent relief; while seven had slight relapses, but of a very mild type, and insufficient to prevent them from work. We might speak of such cases as very much relieved but not absolutely cured. In five I could not hear whether any relapse had occurred. Let it be understood, now, that I have just been analyzing all classes of cases. It will be seen that the twenty uncomplicated cases were nearly all relieved.

The complications with which we had to deal were rheumatism, varicose veins, periarthritis, arthritis, malarial poisoning,

fracture of the neck of the femur with neuralgia of the obturator. Many of these cases were relieved of the pain by means of the galvanic current, and other remedies were employed to meet the special indications.

Before proceeding further with my analysis, a few cases by way of illustration may not be uninteresting.

CASE XXV. Mrs. X., æt. 34, was referred to me by Dr. Knight for the galvanic current October 30, 1879. The patient was a vigorous looking woman, the mother of a large family, and living in the interior of the State. She had been suffering for more than a year with pain throughout the right limb distinctly referred to the course of the sciatic nerve. At first there were remissions, but the pain after awhile became constant, and to this were added paroxysms violent in character. Two months ago she had a severe exacerbation of the neuralgia, the paroxysms being almost continuous, so frequent were they. This exacerbation lasted a week, and confined her to the bed. Any movements about the room which jarred the bed caused the most intense suffering. This attack completely unnerved the poor woman, so to speak, and rendered her quite helpless. It is only a week or two now that she has been able to walk at all. The patient has been confined to the bed most of the time for a year, has been carried up and down stairs, and has been able to walk only short distances without pain. Her nights have been restless, and even when the pain was insignificant she would lie awake, unable to procure sleep.

On examination, the limb had a mottled appearance, the skin was cold to one's hand, and she complained herself of coldness of the limb, though at times warm and tingling, and at other times numb. Pressure over the sciatic nerve near its exit from the foramen was painful, and the sensations were distinctly referred to the terminal branches.

I administered this morning (Oct. 30) a current of twenty-seven cells, Leclanché, applying the positive pole over the trunk of the nerve as best I can, and the negative over the seat of greatest pain, viz., the popliteal space. The application lasts ten minutes, neither pole being moved the while, and there is very little pain experienced, although a lively erythema soon appears around the negative electrode. She expresses herself as feeling greatly relieved immediately afterwards, and is certainly more supple.

Nov. 1*st.* She reports that the limb felt quite warm nearly all day yesterday; that she had very little pain, and that she could walk more easily than before. Current eleven minutes long this morning, and while the erythema is produced as on yesterday, she does not complain of the intensity.

3*d.* Yesterday (Sunday) no application was made. The report this morning is that she felt better on Saturday than she has for a year; could walk without fatigue a longer distance; the limb was warm and felt like the other one. Gets now twenty-seven cells (thirty heretofore) for only four minutes, she not being able to bear it longer. The limb last week was anæsthetic; now it is the reverse.

5*th.* Yesterday being a legal holiday, the office was not open; yet she did not have any pain. Slept well on the night of the 3*d*, but last night (the 4*th*) she did not sleep, although free from pain. A ten-minutes *seance* this morning, superficial vesication being produced under the negative electrode. The current caused considerable "burning" throughout the entire limb.

6*th.* Slept well all of last night; had no pain, and to-day the limb feels quite warm. With great difficulty tolerates twenty-seven cells ten minutes this morning.

7*th.* Had a good night's rest, although she experienced a little pain around an eschar which has been produced in the popliteal space by the negative electrode. She reports, too, that she felt weak after the *seance* of yesterday. The electrode from the positive pole is now placed over the lumbar spine, and that from the negative over the nerve at its exit from the pelvis. Twenty-seven cells are simply intolerable, and twenty-one cause her frequently to wince during the application. There is intense erythema around each electrode, but no eschar or vesication. She expresses great relief immediately afterwards, and has none of the weakness she experienced on yesterday.

8*th.* The patient continues to improve, and is so much encouraged that we permit her to return home in the country, and instruct her to report on the 10*th* or the 17*th* if practicable.

17*th.* Calls to-day and says that she has been free from pain since the 8*th;* has rested well nearly every night, and that she drove yesterday a distance of eighteen miles and had no pain of any kind. This she regarded as a crucial test, as it is something she has not been able to do for a long, long time. She reports additionally that her hip and limb feel quite natural, that the

coldness has not returned, and that all that reminds her that she is not well, is a little difficulty in mounting stairs. A ten-minutes *seance* this morning.

22*d*. Has had four applications since the date of last note, and is now discharged with directions to return should any relapse occur. The terminal branches about the ankle have not been treated at all, and here there exists a little numbness.

Dec. 13*th*. Writes that she is doing well, and with the exception of a little soreness occasionally by day in the calf, she regards herself as cured.

Jan. 10, 1880. Returns this morning for the reason that she has suffered pains throughout the entire limb for the past ten days. Application of galvanism, usual strength, with prompt relief.

12*th*. Has had no pain since the 10th. Takes thirty cells this morning; electrode from positive pole in popliteal space, and that from negative behind the external malleolus.

15*th*. The current was employed on the 13th and 14th, and after to-day's application the patient is finally discharged, with instructions to use the hot-water douche over the calf, should pain return.

March 5*th*. Reports by mail, as follows: "For ten or twelve days after the application of electricity, I suffered considerable pain, and at times was quite lame. Then the pain ceased, and I have not been troubled either night or day for four or five weeks. I have not felt as well for sixteen months."

The case just reported in such detail, illustrates several points.

1. The value of *daily* applications in obstinate and chronic cases for at least a fortnight.

2. The necessity of applying the electrodes, in turn, over every point of pain; for instance, in the popliteal space, until pain is relieved here, and then about the ankle.

3. The sedative effects on the nervous system, in promoting sleep, for instance, even when no pain is present.

4. The insignificance of relapses, after a thorough course of galvanism. There are many cases that fully illustrate this, and I feel well assured that relief afforded in a true, uncomplicated case of sciatica, will be permanent, despite one or two slight recurring exacerbations.

This case was one peculiarly obstinate; yet the intelligence of

the patient was such as to warrant me in hoping for an ultimate cure.

I could report another similar to this one did time permit, wherein relief did not come promptly, because of the difficulty in getting any *seance* long enough. After awhile though, all pain wore off, and the case, if reported *in extenso*, would convince the most skeptical that a direct relationship of cause and effect existed.

Case XVII. of my list was one of pure rheumatic sciatica, and a strong current had no effect at all; in fact, the patient seemed to grow worse after each application. It was then determined to give the faradic current a trial, but he did not return. On tracing him out, several months later, it was found that he had been finally relieved after a three months' rest in bed.

Case XXXII. was treated faithfully for what seemed to be a double sciatica, with only temporary relief. This case, however, was very obscure diagnostically, and on March 24, 1879, Prof. E. C. Seguin, after a careful examination, decided that it was not a case of sciatica. The patient subsequently came under the care of my friend Dr. Putzel, and was cured by the actual cautery and aconitia. Did time permit, I should like to give the case in detail, as there are many interesting points involved.

Case II. of my list, and already partially reported in my former paper, has not received any permanent benefit from a prolonged course. This patient had varicose veins as a complication, and it was supposed that this rather aggravated the sciatica, yet I must confess that I am at a loss to see how this could be. At any rate, she attended faithfully, for several weeks, and while she would get relief for a day or two, nothing permanent has been established. In view of the invariable success in the treatment of those cases, subjected to so fair a trial as this case has had, one could reasonably infer that some organic disease in connection with the nerve existed, or that a neoplasm, in the neighborhood of the nerve, and pressing upon its trunk, were present. The case demanded surgical interference, but the patient cannot be induced to enter a hospital for that purpose.

All the patients, with one exception, were lame; twenty-two were very lame, one came on crutches; eight were slightly lame, and three or four with a crutch and a cane.

Three cases were of less than one week's standing; *three* were from two to four weeks' standing; *two* from two to four months;

thirteen, from four to eight months; *two*, one year; *four*, two years; *one* five years, and *one* six years.

Thirteen were directly traceable to exposure, three to a strain, one to injury, and in fifteen the cause could not be found. Nearly all the patients belonged to the laboring classes. A list of the occupations is quite irrelevant.

In two cases, the current was employed thirty times; in three it was employed from fifteen to twenty times; in six from ten to fifteen times; in seven from eight to ten times; two had seven applications; three had six; three five; five four; and one had only three. The average number was ten.

The battery with which our success has been attained is the Leclanché. The ordinary Stöhrer can be employed, if there be a sufficient number of cells, *i. e.*, twenty to forty. The usual number in the batteries on sale is eighteen or twenty.

I believe that one can the most readily combat the most severe cases of sciatica with a Leclanché. This cell consists of a glass jar, containing a solution of sal-ammoniac and water, in which both poles are placed, the positive composed of carbon, and hermetically sealed in a porous vase; the negative, of a plate or pencil of amalgamated zinc. It is not an expensive cell, and a sufficient number to make a powerful battery can be obtained for a trifle over the cost of an ordinary Stöhrer battery. The current selector can be made very simple, and will be very inexpensive. I am not describing now a fine cabinet battery. The mounting depends, of course, upon the taste of the physician.

In applying the current, let it be understood from the beginning that it must in reality be a *constant* current, and to insure this, be careful not to move either electrode, after it has been secured in the locality desired. The *labile* current is not a constant current. Place the electrode from the positive pole directly over the soft parts, immediately under which the sciatic nerve emerges from the pelvis. This can be found by placing the thumb of the hand, corresponding to the limb affected, over the tip of the trochanter major, and the third, or middle, over the tuber ischii. Then the tip of the index finger will fall directly over the great sacro-sciatic foramen. If, now, pressure be made firmly and deeply here, there will be referred sensations in the distribution of the nerve. Should the referred sensations be not experienced, the finger must be moved about this region until the nerve is found.

In one case we have under observation now, the nerve has a very peculiar place of exit. It seems to emerge very near the sacro-iliac synchondrosis, and the patient got no relief until this was found. It is absolutely necessary, therefore, to find the nerve, and get the electrode over its trunk. The electrode from the negative pole should be placed, as a rule, in the popliteal space, or wherever there is pain or numbness. I have indicated the descending current throughout this paper, and I have indicated purely on theory. I believe that good results are obtained with the ascending current; but I think it safer always to employ the descending. I am aware that authorities regard one about as good as the other. If the nervous centres should be specially irritable, however, I should fear some irreparable injury from employing the ascending current, and I am not sure but that those patients who are reported to have been seriously injured by electricity, are those on whom this current has been employed. I am quite sure that I have injured no patient by galvanism, however strong, and I believe it is because I have been careful always to employ the descending current. The strength of the current should depend on the sensibilities of the individual patient. Let it be just as strong as can be borne, even if vesication is produced. Time and again I have been told by patients that the pain induced by the electricity was nothing to compare to that induced by the disease.

The length of time for each sitting or *seance* will depend, too, on the patient in a great measure. Let it, if possible, extend over ten minutes; fifteen would be better. The applications should be made every day, and, if practicable, twice a day for the first week.

How many are necessary to effect a cure? This will depend upon the duration of the sciatica and upon the severity of the same. Ordinarily for recent acute cases, from six to ten will suffice; in the chronic cases from ten to twenty. If, after twenty applications, there be no perceptible improvement, and you be fully satisfied as to the correctness of your diagnosis, then the battery had best be discontinued. One ought to get good results after two or three *seances*, and if no marked improvement follow five or six, the case should be examined again very carefully, and the diagnosis be fully verified.

Now, in conclusion, I do not know that I can do better than quote some concluding remarks from my former paper, read

before the New York Academy of Medicine, February 6, 1879, nd already referred to.

"With a galvanic battery the practitioner has under control one of the most obstinate and harassing of maladies. Under his observation come all the recent cases, and with a practical knowledge of the constant current, the neuralgia could be arrested before it becomes chronic, and at a stage of all others the most amenable to a judicious electrical treatment."

It will be observed that I have not discussed theories as to the mode of action. I do not know how the current acts, yet it is my conviction that it acts as a nerve sedative.

In concluding this paper I wish to express my thanks to the different members of our hospital staff for valuable assistance in tracing out cases, getting ultimate results, etc. etc. To Dr. L. Emmet Holt, of the Bellevue Hospital staff, I am likewise indebted for similar assistance, and to him my thanks are likewise extended.

THE USE OF CHRYSOPHANIC ACID IN THE TREATMENT OF DISEASES OF THE SKIN.

By R. W. TAYLOR, A.M., M.D.,

NEW YORK.

It may be truly said of chrysophanic acid that, unlike the majority of new remedies, it has a greater range of usefulness than has yet been claimed for it. Indeed, it is in the treatment of certain skin diseases—what quinine is to malarial fevers—almost a specific. This acid, as is well known, is in the form of a yellowish-brown powder, and is derived from an Eastern remedy called Goa powder, in which it exists to the extent of 85 per cent. It is also said to be derived from rhubarb. Originally this Goa powder was used for ringworm in Eastern countries, and it is only within a few years that its use has been extended to the treatment of other cutaneous affections. To Dr. Balmano Squire, of London, certainly belongs the credit of our more extended knowledge of the usefulness of this valuable agent and its derivative acid. Having myself used it extensively in a number of skin affections, I desire now to present my views as to its general sphere of usefulness, and to consider certain drawbacks which we must admit there are in its application. I hope thus to draw out the experience of other physicians who have used the drug.

First, let us consider the form and strength of the ointment to be used, since this is the most convenient mode of application. Some of the observers who first used it recommended a strength of two drachms of the acid to the ounce of lard or cerate. But I am positive that in this country this strength is far too great, such an ointment is rarely necessary, and should always be used with the greatest caution, as I will point out later. I may here remark that I have found no necessity for the use of hot lard in the formation of the chrysophanic acid ointment, nor for the solution of the acid in benzol before mixing with the cerate or

lard. My preference is that the acid should be thoroughly triturated with a few drops of alcohol before mixing it with equal parts of vaseline and simple cerate or cold cream. This makes a smooth ointment, which readily permeates the skin. As to the strength of the ointment preferred by me, I would say that I constantly use it in the proportion of ten grains to the ounce of cerate, and rarely higher than one drachm to the same quantity. In speaking of the various diseases, I will state the proportions usually found beneficial for each. In general, brisk inunction once or twice a day, leaving a coating of the ointment on the parts, is all that is necessary; but in some instances it is essential to apply the salve spread on lint as a plaster. Care should always be taken that only the morbid tissue is thus covered.

To state its general applicability briefly, I may say that chrysophanic acid ointment is useful for chronic subacute skin affections attended with superficial infiltration or with much epidermal proliferation. In cases of very deep infiltration it is not, I find, so beneficial as other agents are, for the reason that the strength of the ointment required is necessarily so great that it of itself causes inflammation around the part, and even then does not yield any very excellent results. Then, again, it is not to be used upon excoriated surfaces. But in cases such as psoriasis, lichen planus, in some of the early papular syphilitic eruptions, its action is marvellous. My general rule is to employ it only in cases in which the epidermis is intact or not shed, or again when this layer is much thickened. The disadvantages of the ointment are, its staining qualities, its tendency to produce erythema, severe œdema, and sometimes furuncles. While we cannot prevent the pigmentation of the skin, we can use measures for its removal, such as brisk friction with powdered pumice-stone or a pad of flannel. As regards the inflammatory sequelæ, I think that as the observer becomes more familiar and skilled in the use of the agent, he will be less liable to see them. When I first used the ointment in the proportion of two drachms of the acid to the ounce of fat, I several times in cases of psoriasis saw much œdema around the patches following the application, but still the disease yielded so quickly and the inflammatory symptoms were so speedily relieved by cold water dressing, that in some urgent cases I did not regret its occurrence. However, I would from further experience counsel caution, and advise

a moderately strong ointment, although the cure will not be quite as rapid. In some rare instances little boils, and large ones even, will appear after the application of a mild ointment, and sometimes it will be necessary to stop the remedy in consequence, but such instances are quite rare. One fact has struck me very forcibly in using this agent, namely, that it has not very pronounced antipruritic properties; consequently, in some affections attended with severe itching we are compelled to combine with it one of the tarry oils, or camphor, or carbolic acid.

Let us consider briefly the value of chrysophanic acid in various skin diseases, for, as I have said, its range of application is very wide, greater than is generally conceded, and is not by any means limited to the treatment of psoriasis and ringworm. In acne much good can be obtained from the use of a mild ointment, ten to twenty grains to the ounce. But here its staining properties are an almost insuperable objection to its use. Yet my experience in dispensary practice has convinced me that many cases of simple and of the indurated form of acne will be benefited by it more than by any other single remedy. I have directed patients to just bathe the face well with hot water and then to rub over each papule or tubercle a little of the ointment, leaving a film of it to be absorbed. The result is that the next day the whole face is stained to the copper color of an Indian, to remove which it is necessary to scour the parts well with powdered pumice-stone, which operation, however, is not always followed by complete success. Great as is this drawback, there are persons who will undergo the annoyance in hope of ridding themselves of their chronic disfigurement. In cases of acne complicated with rosacea, and in rosacea, I have seen excellent effects from a tolerably strong ointment, twenty, thirty, or forty grains to the ounce. I have seen the dilated superficial capillaries wither under its use several times in very severe cases. Let me here say, that great caution must be exercised in using a tolerably strong ointment on the face, since in this situation it is liable to cause severe inflammation, sometimes resembling erysipelas. The best mode of procedure is to use at first a mild ointment and simply rub a little in, carefully watching the result. Then we may go a little further and apply it spread on linen lint constantly. Should at any time inflammatory symptoms show themselves, the application must be suspended and

water dressing applied. But care and observation will make the prescriber skilful in avoiding such accidents.

In eczema, the use of chrysophanic acid is limited, I think, to chronic localized spots, not attended with great inflammation. To these it can be applied in moderate strength continuously; but in general it will be necessary to combine with the ointment a sufficient quantity of the oil of cade, birch oil, or tar to relieve pruritus. In chronic eczema of the palms of the hands, I have used, with great benefit, an ointment made of the acid fifteen grains, diachylon ointment one ounce. The same ointment I have used, with equally good results, in chronic cases of scaling eczema of the scrotum, in which was considerable thickening. When used upon the hands or scrotum, the ointment should be spread on the limb, and kept continuously applied. It may be necessary, of course, to envelop the former in India-rubber gloves, and perhaps to envelop the scrotum, over the dressing, with gutta-percha tissue. In any case in which itching is severe, I think a sufficient quantity of any oil should be added. In two instances of sycosiform eczema of the beard in the chronic, and somewhat infiltrated stage, I produced a cure by using ten grains of the acid to the ounce of diachylon ointment, the dressing being kept on continuously. This, indeed, was after the usual remedies had failed.

In ringworm of the scalp, chrysophanic acid is often very useful, but it is necessary to use it with considerable care, as it here may produce severe inflammation. Ten grains to the ounce of cerate and vaseline is generally sufficiently strong. Of course, it is necessary to use epilation in bad cases. One drawback to its use, however, is the staining of the parts to a pure flesh-brown color. I think it well to mention the fact to parents, when stating to them the advantage of rapid cure, which we are warranted in promising from use of the acid. Ringworm of the body is readily cured by an ointment of moderate strength, rubbed in several times daily. When used upon the trunk or extremities, chrysophanic acid will inevitably stain the underclothes. To get over this trouble as well as we can, I state the fact to patients, and advise them to wear such articles as are well worn, and to continue their use while under treatment, since the necessary time is usually not long.

In lichen planus I have seen some of the most rapid cures produced by this agent, but the itching which usually accom-

panies this affection often necessitates the addition of some anti-pruritic agent. In other chronic forms of lichen, this acid may often be used with great benefit. I have now under treatment a case of lupus erythematosus, which I am sanguine of curing by an ointment of twenty grains of the acid.

In a number of cases of papular and scaling syphilides, I have had excellent results from the use of a mild ointment. Particularly valuable is this agent, combined with diachylon ointment in the scaling of syphilides of the palms and soles. Its application must here be continuous, and a previous removal of the scales may be necessary; and in severe cases the hands should be enveloped in India-rubber gloves.

It is to its success in the cure (perhaps I may more properly say the removal) of psoriasis that this acid owes its great and well-deserved reputation. And here I may add that my experience in its use convinces me that the high praise that has been accorded to it by others, is well deserved. Indeed, it is rare to see any agent act as promptly and uniformly as this one does. One feels assured, in prescribing it, that a good result will follow its use. In psoriasis, it is generally necessary to use mild ointments, from ten to sixty grains; rarely any stronger. Care and caution should be exercised in treating children, particularly if very young, since severe inflammatory reaction may follow the use of a strong ointment. For such patients, I have rarely had to exceed fifteen grains, and I usually employ only ten. Of course the scales must be removed by scraping, or by baths, and the ointment should be well rubbed into the patches. If inflammation follows, the parts must be treated by the water dressing. In some very chronic cases, I have used the two-drachm ointment, and in order to avoid inflammatory reaction, I have ordered the parts to be enveloped in linen, and kept continually wet with cold water. In this way I hurried the cure, and avoided bad results. In general, however, a mild ointment is sufficient, and the strong one should not be used, unless the patient is fully under control.

Though chrysophanic acid has been recommended in the treatment of tinea versicolor, I am able to say, from considerable experience, that it is less efficacious than the remedies usually employed.

THE TREATMENT OF SCROFULOUS DISEASE OF THE SKIN.

By JOHN V. SHOEMAKER, A.M., M.D.,

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In referring to this important and vexatious disease upon this occasion, I have omitted the description of its course, which has already been so ably discussed by many modern writers, and have simply confined my remarks to a brief but practical account of its treatment. It was the indefinite and uncertain action of many of our standard preparations upon scrofulous disease of the skin that induced me to carefully study the action of other remedies upon this disease After several years of practical work with the various remedies, I have concluded to bring the result of my labor before this Section in order to lead, if possible, into further investigation of the subject.

The literature of scrofuloderma presents a large number of remedies which are regarded by their advocates as specifics for this disease. Leeches, issues, blisters, the iodides, the mercurials, *cod-liver oil*, iron, quinine, and barium have each had their respective supporters. Having repeatedly failed to cure many of those who applied to me for relief by using the remedies just named, I was finally led to try the chlorate of potassium internally with the most happy results. I claim, after watching the action of this remedy in a large number of cases of scrofulous disease of the skin, some of which will be included in this paper, that the chlorate of potassium overcomes the morbid condition in the system that leads to the development of various lesions on the skin. The following cases are a few of many that have come under my notice, and will illustrate the value of the above-named remedy.

Case I. A lad aged 13, rather stout, and of sallow complexion, came under my observation at the Pennsylvania Free Dispensary

for Skin Diseases in February, 1878. At this time his skin was harsh and his expression was haggard and worn. The most prominent part of the disease involved the nose, which was somewhat enlarged, and the tip was covered with exuberant granulations that extended down on both sides of the alæ and likewise passed up into the mucous surface of both anterior nasal outlets. These flabby granulations were covered with a thin pus, and bled freely on being touched. In addition, the upper lip and the buccal regions were the seat of several dull red, tubercular formations, and the glands around the inferior maxillary were slightly enlarged. These morbid conditions, together with the old scars that were scattered over both the face and neck, were a sufficient tell-tale of the disease. Upon inquiry I learned from the patient that he lived with his parents and two sisters in a small court in the lower part of the city. Not being able to obtain much of the family history from the boy, who was very dull in intellect, I called at his home to make further inquiry into his case. I found the family, consisting of the father, mother, the lad, and two sisters, living in two small and very cleanly rooms. The mother had every appearance of good health, and stated that her husband was sound in every respect and had only one fault, which was that of occasionally getting drunk. I examined the two sisters of the boy and found them free from all signs of scrofulous disease.

After some effort the mother informed me that during the period of her pregnancy with this boy she frequently suffered from hunger, by reason of the father being drunk and not supplying the necessaries of life. At the time of the boy's birth he was unhealthy, and had occasionally, during his first and second years, been deprived of the proper food. I succeeded, after repeated attempts, in meeting the father of the lad, who was healthy in every way, and frankly acknowledged his little weakness for getting drunk, but strongly *protested* that he had never been afflicted with any venereal trouble. I therefore concluded that the boy's condition was due to a disordered state of the blood, beginning very probably in intra-uterine life from improper nutrition.

I began the treatment by using internally, small doses of the accepted remedy, cod-liver oil, but was compelled to discontinue its use in a short time, owing to the oil disagreeing with the stomach. The iodide of potassium had the same effect, and the

corrosive chloride of mercury ran off by the bowels. I finally concluded to discontinue for a time all constitutional treatment, and to try the use alone of local remedies. I began the local treatment by puncturing and scarifying the surface; used, also, in turn pressure, blisters, the mercurials, the iodides, the sulphate of copper, and various other astringents, and as soon as the disease would disappear at one point, it would go on even more violently at another.

Six months were consumed in this way in trying the various internal and local remedies, and all to no purpose, as the patient's condition remained unchanged. After these repeated trials and failures with many of the old remedies for this disease, I made up my mind to try the chlorate of potassium, a remedy which had already proved very efficacious in some lighter cases of scrofulous disease of the skin under my care.

I began the new treatment by giving the patient two grains of the chlorate of potassium three times daily; the dose was gradually increased until he could take five grains four times daily. In the course of two weeks the spots became lighter in color, the skin clearer, and this state of improvement continued until my patient was entirely cured in the month of November, 1878. In this case I began the treatment with a mild aperient, ordered a substantial diet, and applied the sulphate of copper to the granulations once a week.

CASE II. Mary W., aged 19, came under my care at the same Dispensary in September, 1878. She was brought to me by her mother for enlarged maxillary glands, loss of appetite, and great weakness. Her complexion was sallow, and she was very thin. Her medical history was as follows: she had been ailing ever since she was three years of age; about that time the mother noticed small lumps around the neck, and an eruption on the scalp as the child was recovering from scarlatina. Her mother further stated that after this attack her child would improve for a time, and afterwards, upon the slightest change in the weather, would be seized with rheumatism, which was always followed by great prostration, loss of appetite, and either diarrhœa or constipation. The patient had continued from time to time to suffer from rheumatism, until about one year ago, when she was seized with even a more severe attack than at any previous period. The mother, who was very intelligent, added

that the physician in attendance at that time had succeeded in curing the rheumatism, and since that her daughter had not been troubled with it. I was also informed by the mother that after this last attack of rheumatism, her daughter had continued to lose flesh and had grown very pale and weak. The family history, as far as I could learn, was good; the father, mother, and one brother enjoyed the best of health.

On examination the scalp was found covered with sebum, the hairs were dull and lustreless in appearance, and were falling out in large numbers, the conjunctiva was injected, the pupils dilated, the eyelashes long and droopy, the face was pale and haggard, and the maxillary glands were enlarged, with here and there small openings discharging a thin and unhealthy pus. I prescribed a dessertspoonful of cod-liver oil three times a day. In the course of two weeks no improvement had taken place, and I was compelled to omit the cod-liver oil by reason of it disagreeing with her, and substitute for it three-grain doses of the chlorate of potassium four times a day. I advised the continued use of substantial food, and used locally a mild tar ointment. From this date the improvement was steady, the appetite returned, the bowels became regular, and at the end of a a little more than two months the patient was quite well.

Case III. In the month of November, 1879, I was called to see a young girl, aged 15, of fair complexion and of healthy appearance. Her parents were in good circumstances; she had been well fed, and had been treated with the utmost attention by her physician, who gave me at the time the following account of her case. Two years previous she had a severe attack of scarlatina, and shortly after, while convalescing, the maxillary glands began to enlarge and the scalp became covered with sebum. This condition had continued to grow worse, notwithstanding the best of care and attention from her physician. At the date of my call I found the scalp covered with patches of sebum, and the hair presenting an unhealthy appearance. The skin around the maxillary region and down the neck was of the natural color in patches, interspersed with red and even violet spots; the glands were hard in some parts, soft and boggy in others, while here and there small openings about the size of a pin could be observed, through which a thin and unhealthy pus escaped. Her physician informed me he had given such medi-

cine as he thought would be suitable to her, but without the slightest benefit. Chlorate of potassium in five grain doses was given; the parts were washed with borax water; no fresh development of the disease showed itself, and in about nine weeks she was quite well.

Case IV. Emily D., thin and delicate, aged 7, was the subject of severe scrofula, and had been so since her birth. The child's aunt brought her to the Dispensary December, 1879, but could give no history of her case except that both her parents had died from consumption. Her skin was pale and of a yellow appearance; a thin discharge was detected from the left ear; the maxillary glands were slightly enlarged; a small ulcer existed below the angle of the inferior maxillary of the right side; another one a little larger, irregular in shape, covered with a watery secretion, was situated on the forearm; the hands and feet were cold, and the abdomen was distended and hard. Two-grain doses of the chlorate of potassium were ordered, which were gradually increased to five grains, four times a day, with good food, weak citrine ointment locally, and plenty of exercise. In six weeks the ulcers had disappeared, and the improvement was so marked that the child would scarcely have been recognized.

Case V. Willie B., aged 14 months, a scrofulous baby and very cachectic; scalp covered with crusts; maxillary and inguinal glands enlarged, with small inguinal abscess from a broken down gland, and abdomen large. Healthy father and sickly mother. Ordered one grain of chlorate of potassium in arrowroot drink, and increased the dose to two grains, four times a day. Fed the child on milk and arrowroot drink, opened the abscess, poulticed the crusts, and oiled the scalp. Two months later, when I last saw the baby, he was healthy-looking and quite free from the disease.

The cases which have been adduced present, I believe, very fair examples of scrofulous disease of the skin as it is met with in practice. I endeavored, prior to using the chlorate of potassium in similar cases to those I have just enumerated, to overcome the disease by following the routine plan of treatment, with but a small percentage of cures. I worked away with cod-

liver oil, iron, and quinine, which preparations either interfered with digestion, or ran off by the bowels and so prevented many of my patients from getting well. Many unsatisfactory results in this way finally led me to try the chlorate of potassium, and to my astonishment I obtained remarkable results.

My attention was directed to the efficacy of the chlorate of potassium by the beneficial effect that followed its use upon a patient having scrofuloderma who applied to me for treatment for mercurial salivation. I gave the patient a solution of the chlorate of potassium, and was surprised to find as I continued the solution that the scrofulous condition gradually disappeared until the case was cured. I was led by the good result in this case to try the same remedy in other patients, and was agreeably astonished to find continued success in its use.

The chlorate of potassium has a marked influence on all suppurative processes. It prevents and arrests, to a great extent, suppuration. Thus in persons who have had tubercular deposit in the glands of the neck, threatening to end in suppuration, the use of the chlorate of potassium will reduce the inflammation and prevent the formation of pus. In another class of cases of this group in which the formation of pus has taken place, the influence of the chlorate of potassium is still more conspicuous. For instance, if a child nine years of age has an enlargement of the glands around the inferior maxillary following measles or scarlatina, which by the way is very common, deep-seated suppuration takes place attended with great pain and constitutional disturbance. The skin gradually changes from the normal color to a red, and even a violet, the small tumors feel soft and boggy, and after a time small openings appear, from which issue a thin and unhealthy pus. Now such a troublesome and vexatious condition will quickly give way to the administration of two or three grains of the chlorate of potassium four times daily. The deposition of fresh tubercular material in the glands will be checked, the thin and unhealthy pus will become abundant and laudable; many abscesses about developing will dry up, while those that are open will gradually heal. The chlorate of potassium whilst thus influencing locally the scrofulous condition, will likewise improve the general health by removing all the constitutional disturbances associated with this disease; in which, in many instances, the use of cod-liver oil, iron, and quinine had entirely failed.

As to the mode of administration of the chlorate of potassium, I have usually given it in from one-half to ten-grain doses dissolved in pure water three or four times daily. In the above doses I find it well borne by the stomach even in those who are very weak and enfeebled. I generally begin with from one-half to one grain one hour before meals, and gradually increase the dose until the patient shows some signs of improvement. The continued use of this drug for a time will increase the appetite, fatten the patient, render a previously dark skin clear and florid, and add tone and vigor to the system. Those who are large, flabby, and apparently vigorous, will improve, as a rule, better under small doses, as large amounts will sometimes serve still more to increase the quantity of fat on the body. On the other hand, the pale, weak, and enfeebled will bear much larger doses, and will often increase very rapidly in weight.

The chlorate of potassium evidently changes and improves the quality of the blood, but as a remedy for this affection it has hitherto received very little notice except from Dr. Harkin, of Belfast, in 1860 and 1861. This gentleman, in an admirable paper on the chlorate of potassium in the treatment of consumption and scrofula, published in the *Dublin Quarterly Journal* of November, 1861, claims perfectly marvellous results by its use in both these affections. Dr. Harkin in this paper cites the cure of several well-marked cases of consumption, refers in a general way to its remarkable action in scrofula, and adds that in its use the blood appears altered in character, its solid constituents, its fibrin and red corpuscles, increase, muscular energy gradually returns, and even a disposition to plethora develops itself.

I not only corroborate what Dr. Harkin has observed upon the action of this remedy, but I think my experience adds additional light on its use in scrofulous disease of the skin. I have as yet been unable to find any full statement of its use in these scrofulous affections, except in the brief account just named. I have therefore, after extensive experience in its use, come to the conclusion that it is the only internal treatment of much good in scrofuloderma, but it must be employed in conjunction with good food, the proper hygienic surroundings, together with a judicious combination of appropriate external means according to the exigencies of each particular case.

This treatment is based upon the assumption that the disease

is caused by an improper state and composition of the blood, which destroys its fitness for the nutrition of the tissues. I further believe that the judicious use of the chlorate of potassium tones up the digestive system, and so furnishes the blood with its proper and essential ingredient with which to repair the natural waste and decay of the tissues. The experience of Dr. W. Nicholson as to the action of alkalies as expressed in the *Practitioner* of January, 1880, I think fully corroborates the views I have advanced on the effect on the system of the chlorate of potassium.

Dr. Nicholson, in referring to the alkalies in anæmia, thinks that they ought to take the place of iron in the treatment of this affection; that they improve the tone of the digestive system, increasing the appetite, aiding the liver to work, promoting the flow of bile, and clearing the blood and urine from lithates or other sediments and impurities, and there is little doubt that they, more than any other remedy, restore the digestive tract to a state of health, while iron, instead of giving tone, is apt to disorder the digestive tract. This gentleman uses the bicarbonate of potassium in that abnormal state of the blood present in anæmia, and I know that the chlorate of potassium will not only act in the same manner upon anæmia, but also in the various scrofulous affections.

I desire, in concluding this paper, to add that, if judicious treatment be given to those suffering from scrofula before marriage, the extension of the hereditary taint in the issue can be arrested. Many medical men, on the other hand, believe that the extension of the disease can only be arrested by such persons refraining from marriage, and they advise their patients to that effect. Physicians giving such advice to tuberculous, sickly, and scrofulous persons, will find that it will not deter them from marrying, even though they may have pointed out to them that the issue of such alliance will in all probability be scrofulous. I think it therefore becomes the imperative duty of the physician when consulted by scrofulous persons concerning their future welfare, to provide against the extension of the disease by doing all in his power to overcome the disordered function and establish a condition of healthy nutrition before marriage. This noxious state of the system of persons suffering from scrofula, I again repeat, can be best removed by the use of chlorate

of potassium internally, together with good food, suitable hygienic surroundings, and appropriate external means.

If the chlorate of potassium be employed, with the aids just named, upon persons afflicted with scrofula, it will be found that the remedy will fulfil all that I have claimed for it, and will place such individuals in such a healthy condition that in case of marriage the issue will be sound and healthy.

SPHYGMOGRAMS: WITH NOTES OF AUTOPSIES.

By H. R. HOPKINS,

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The sphygmograph has been before the profession for nearly twenty years; its uses and advantages have been ably presented by eminent writers and speakers, various modifications and improvements in its mechanism have been introduced, and yet it has no place among the clinical aids of the practical physician. Evidently we have before us a case of arrested development, and one that must have been a bitter disappointment to the men who heralded with so much enthusiasm the advent of the newcomer. What are the reasons for this delay of appreciation and recognition of the value and work of the sphygmograph? Plainly the cause is the fact that in a measure there has befallen this instrument that which so frequently befalls beautiful theories and well-constructed hypotheses, the failure to stand the test of verification. The sphygmograph has not done the work which commands recognition. In the hands of a few expert observers it does reveal the secrets of the circulation of the blood in an encouraging way; but even these few men are obliged to read its characters by faith rather than by sight; while in the hands of the average observer its records are uncertain, contradictory, and discouraging. Is this failure for the reason that the end sought is from the nature of things unattainable, or is the delay that which is incident to real growth? The settlement of this question cannot but be of interest; it needs no argument to establish the fact that the phenomena of the circulation of the blood, physiological and pathological, are the most complex, the most universal, and the most important that can engage the attention of the physician. Equally true is it that of all methods of studying physiological phenomena, the graphic method is by far the most successful; consequently we are not surprised that the inventor of the sphygmograph—an instrument which has

for its work the task of making apparent the otherwise imperceptible qualities of the pulse, and of fixing these qualities in a legible and permanent record—should herald his discovery as one that was to be of the utmost practical importance. It by no means follows, because twenty years have passed without bringing the realization of these hopes, that the premises upon which a great future for the new instrument was claimed were untenable; that study in this direction must of a necessity be fruitless; that this was another attempt to attain the unattainable.

If the fundamental proposition, that, besides the number of beats per minute, the pulse has other qualities of the greatest physiological and pathological interest, be true, then the inventor of the sphygmograph had reason for his expectations, and the time has not yet come for his complete discouragement. Strong magnifying glasses were used in the study of anatomy more than two hundred years ago, but the achromatic objective and the science of histology are works of our own day.

Every one who has used the sphygmograph will bear witness, that, imperfect and unsatisfactory as it is, it unquestionably demonstrates that there are in the pulse important qualities imperceptible to the touch. What these qualities are, what relations they bear to health and to disease, are questions upon which the sphygmograph must furnish much information before it enters upon its future. In order to gain this information there must be many observers, and very many observations; the instrument must be made infinitely more sensitive, more precise, and more uniform in its performance than at present. Observations will always be vitiated by personal and instrumental errors. The work of eliminating these errors, of drawing the proper inferences and reaching safe generalizations, can only be done by correcting the labors of one man by the aid of the labors of others. As a step in this direction, your attention is called to the accompanying traces.

In presenting these sphygmograms, I wish to say that they are printed from a copperplate prepared by Mr. Henry Chandler, of Buffalo, and are perfect fac similes of the originals, now in my possession.

I have omitted to note, as I also fail to observe, the pressure under which they are taken, being convinced that there is only one pressure appropriate to a given pulse, and that the trace itself

can be relied upon to show whether the right or the wrong pressure was used in its taking.

In general, the degree of pressure requisite to obtain traces is determined, not so much by the state of the pulse as by the quality and quantity of the tissues of the wrist. In general this is the case; but on arteries, where the tension is high, more pressure is needed than on those of low tension, quite irrespective of the state of the overlying parts. If this is the case, I cannot see the propriety of registering the pressure used, as the degree of arterial tension will record itself in the trace, and the condition of the parts has no special bearing upon the subject.

The traces were taken from subjects whom I have had frequent opportunities of observing, and I am confident that each trace is characteristic of the pulse which it represents, and that this was the habitual pulse of the individual.

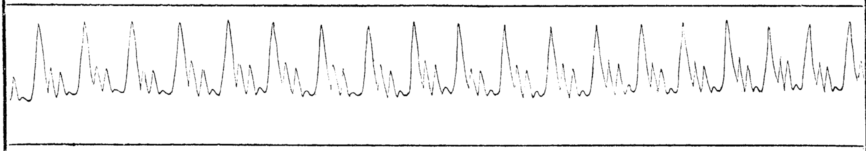
They are selected for the reason that, in each case the peculiarity of the pulse was plainly apparent to the touch. This was particularly the case in Figs. 4, 5, 6, and 7, which are examples of high arterial tension. In each of these the artery was overfull between beats, could be traced far up the forearm; could be rolled under the finger like a tendon, and in varying degrees were long, hard, and persistent pulses.

The autopsies were made in the presence of several members of the profession, and there was no disagreement as to the pathological conditions present. With the exception of Fig. 8, they were taken with Poud's sphygmograph, rebuilt by Mr. A. M. Edwards, of Buffalo, who is at work upon the matter of determining how simple and accurate an instrument can be devised for this purpose. Fig. 8 was taken with his instrument.

I submit these traces to the criticism of the profession, believing that each trace, in its way, represents something of the peculiarity of its subject, and also believing that we have only to diligently observe, record, and compare observations in order to furnish data, from which will be drawn the deduction that many of our chronic diseases have characteristic sphygmograms; that the peculiarity of the circulation is one of the earliest manifestations of disease, and that its recognition is of the utmost diagnostic and prognostic importance.

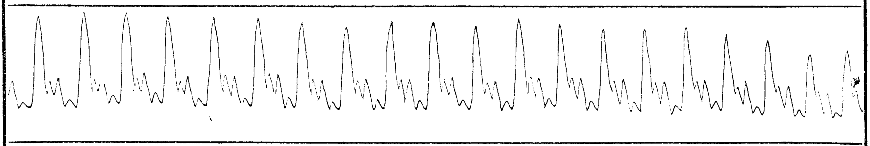
Figs. 1 and 2 were taken from patients in the Buffalo General Hospital, from cases of ataxia of long standing; Fig. 1 of two, and Fig. 2 of five years.

Fig. 1



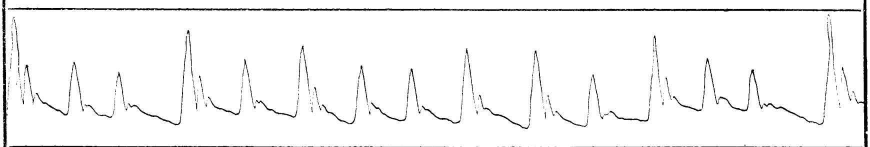
H. K., Age 51. Locomotor Ataxia.

Fig. 2



W. K., Age 44. Locomotor Ataxia.

Fig. 3

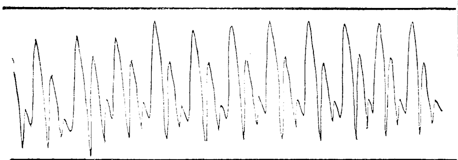


I. T. H., Age 84. Cardiac Dropsy.

Fig. 4

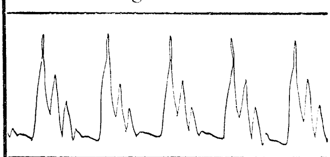
P. W. S., Age 70. Bright's Disease with Aortitis Deformans.

Fig. 5



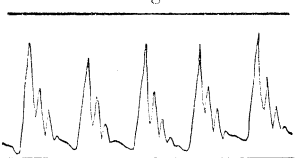
W. E. S., Age 28. Bright's Disease with Hepatic Capsulitis.

Fig. 6



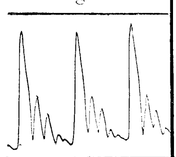
G. D., Age 62. Bright's Disease

Fig. 7



J. H., Age 61. Endarteritis with Atheroma.

Fig. 8



C. C., Age 25. Normal trace.

They seem quite peculiar, and remarkably similar; are the only ataxic traces I have, and are unlike anything else in my collection. Both patients have been under observation for months, and the peculiarities of the traces are constant.

Fig. 3 is introduced to show the value of the graphic method in illustrating circulatory phenomena. It tells the story of a heart undoubtedly of great power, slowly breaking down under the work of driving the blood through thickened arteries and asthmatic lungs. He had asthmatic cough for ten or fifteen years; had been confined to the house for nine months with dyspnœa and anasarca of the feet and legs. The heart's action was without rhythm, the area of cardiac dulness was increased, but no murmurs could be heard. The effect of an intermission upon the systole is well shown. He died about a month after the trace was taken, and an autopsy could not be obtained.

Fig. 4 is of the greatest interest, from its pronounced characteristics, and the unmistakable nature of the disease. He had been a man of marked intemperate habits. An associate said of him, "he had not been to bed sober in twenty years." He was under my observation for five weeks, and the peculiarity of the pulse persisted to within six hours of his death. During this time his suffering from dyspnœa, or rather breathlessness, was intense; he had slight dropsy, and a small per cent. of albumen in his urine. He was slightly emaciated when I first saw him, and his pulse was a revelation. The artery could be seen pulsating and vermiculating well up the wrist, and its impulse was simply prodigious. He had an increased apex impulse, an increased area of cardiac dulness, an accentuated second sound, marked episternal pulsation, and no murmur. His kidneys were found to be small, red, granular, hard-cutting organs, as was also the liver. The left heart was hypertrophied and thickened; the right was nearly normal. The aorta was largely dilated and generally atheromatous; its valves held water. When split open, the following measurements were taken from the inner surface: At the origin of the innominate artery, nine inches; at the subclavian, six inches; two inches beyond this point, four inches; at the cœliac axis, three and three-quarter inches. The innominate, one inch above its origin, measured two and one-eighth inches.

This trace is extremely interesting from its relation to the question of what is the peculiarity of the trace of high arterial

tension. Certainly here was a case in which the conditions known to produce high tension were present in a marked degree. Evidence that high tension had existed for a considerable time was furnished by the dilated aorta. The obvious qualities of the pulse were those of high tension, and the peculiar characteristics of the trace appear in every specimen, of which I have more than twenty. I think there can be no doubt but that this trace is characteristic of the pulse from which it was taken, and is probably characteristic of extreme high tension in arteries somewhat advanced in fibroid degeneration. The high and regular rise tells of a powerful heart, and the extreme disproportion between the tidal and dicrotic waves is a perfect demonstration of the correctness of the authorities who claim that low pressure favors the development of dicrotism. Again, the trace is suggestive from the fact that the tidal wave is quite peculiar, while the aorta, which is supposed to cause that wave, had the most marked abnormal characteristic. I have in my collection several traces from persons with more or less advanced aortic disease, and one cannot but see a tendency of the class to resemble this trace.

Fig. 5 was from a young man in the last stage of Bright's disease. He died three days after I saw him. The autopsy showed granular kidneys, cirrhosed liver, hypertrophied left heart, with healthy vessels. Here, again, is seen the disproportionately small dicrotic wave, the sure sign of high arterial tension, which in this case exists in young and elastic arteries.

Fig. 6 was from a patient in the General Hospital, who had been suffering from Bright's disease, of something more than a year's standing. The trace was taken early in January of this year, at which time the patient was not particularly distressed by his condition, and after a month's stay in the hospital, he thought he was able to go to work, and, at his request, was discharged. He was soon back again, and ran down pretty fast, and died April 14th.

At the time this trace was taken, the pulse was one of moderately high tension. During the later weeks of his life the tension rose decidedly, and became very marked, and persisted to within forty-eight hours of his death. I submit this as a trace of moderately high tension in a slightly thickened artery, one that should warn the observer to suspect the existence of renal disease, even in the absence of other symptoms.

The autopsy was held twenty-six hours after death. The kidneys were extremely atrophied, pale, and granular; the right weighed one, and the left two ounces. The pelvis of the right contained eight small calculi; that of the left about the same weight of sand. The heart weighed twenty ounces, the enlargement being mainly of the left side. The aorta was normal in shape, its valves were noticeably perfect and healthy, while its coats showed now and then a spot of beginning atheroma. The liver weighed three and a half pounds, was slightly granular and firm. The spleen weighed three and a half ounces, and was also more firm than usual.

Fig. 7 was taken from a prominent lawyer of Buffalo, who had been out of health for more than a year, with symptoms of loss of strength and flesh, and bad digestion. He had had several attacks of fainting, was about thirty pounds below his usual weight, and was thought to be breaking down. From the resemblance of this trace to Fig. 6, I suspected that he had incipient Bright's disease, but the urine was neither copious nor albuminous. Soon after I saw him, he was down with a bad fainting, and after being in the house a couple of weeks, died from hemorrhage of the bowels.

The autopsy showed the heart to be fairly healthy, perhaps a little soft, and fatty; the left kidney to be small, puckered, and firm, but not sufficiently so to be called granular; the right kidney to be enveloped in fat, and nearly as large again as the left, soft, and light colored, and contained a sac holding forty to fifty grams of fluid, thought to be urine. The ureter was open, and the pelvis empty. The aorta was generally atheromatous, but not deformed. While to an extent the result of this examination was disappointing, upon reflection it was encouraging. I had expected to find decided renal disease, in spite of the failure to demonstrate the presence of albumen in the urine. The trace was surely one of high tension, and very like that produced by Bright's disease, but the kidneys could not be so classed. On the other hand, there was positive evidence of an abnormal circulation in both kidneys. The left was puckered and firm from capsulitis, and the right was distended with a sac of fluid of fifty grams. Plainly here was cause for decided obstruction of the renal circulation, and the consequent high arterial tension.

Fig. 8 is introduced, in order to call the attention of workers with the sphygmograph to what I consider a perfectly taken trace.

If this instrument is to be of any service to the profession, it must be made to perform more perfectly than the most of those do whose works have fallen under my observation. Traces can have no value, unless they bear with themselves the evidence that they are individual, and probably characteristic of the pulses from which they were taken. Undeveloped, half-taken traces can only be misleading and discouraging, and I would submit, for the criticism of the profession, this rule—Mistrust the sensitiveness of your instrument, or your skill in applying it, when, in a pulse of average strength, you fail to show the tidal wave as terminating in an acute angle, and remember that you have not perfectly taken such a pulse, until the trace shows the first and second elements clear and distinct, the dicrotic wave beginning and ending in an acute angle, and most important of all the diastolic line shown in oscillations.

Fig. 8 was taken from a member of the profession, an athlete of six feet high, weighing one hundred and seventy-five pounds, and who was remarkable for strength and endurance.

A FURTHER CONTRIBUTION TO THE LOCAL TREATMENT OF PULMONARY CAVITIES.

By WILLIAM PEPPER, A.M., M.D.,
Professor of Clinical Medicine in the University of Pennsylvania.

I HAVE two objects in offering this brief summary of my recent experience in the local treatment of pulmonary cavities. It is, in the first place, desirable that each observer engaged in such an important work as the attempt to effect a radical improvement in any part of our treatment of pulmonary phthisis, should publish fully and promptly the favorable or unfavorable results obtained. Moreover, I promised my highly-esteemed friend Dr. H. H. Smith, Chairman of the Section of Surgery and Anatomy of this Association in 1878, that I would, at that meeting, present this summary of results, in connection with a brief allusion to the local treatment of pulmonary cavities contained in his able address[1] before his Section. Circumstances prevented this, but I have felt as though it were my duty to offer these results to the appropriate Section of the Association at the earliest convenient opportunity.

I may say in advance that, after pursuing the use of intrapulmonary injections assiduously, until their entire harmlessness was demonstrated, and until it seemed to me that the range of their applicability was fairly determined, the attempt has been made to medicate the interior of pulmonary cavities by other means. It is of course well known that frequent efforts have been made to do this successfully. Indeed, considering that it is an established clinical fact that pulmonary cavities do, in a small proportion of cases, result in recovery by contraction and cicatrization; while, on the other hand, the dangers and inconveniences resulting from their presence are so very serious; it is but natural that continuous efforts should be made to learn the most efficient mode of treating them. The chief indications

[1] Trans. Amer. Med. Association, vol. xxix., 1878, p. 205.

that are presented for such treatment are: the disinfection of the contents of the cavity; the modification of the lining surface of the cavity so as to lessen the amount of expectoration and of irritating and exhausting cough; and the modification of the morbid action in the layer of tissues immediately surrounding the cavity. In attempting to secure these results, medicated liquids have been injected down the larynx and bronchi; brushes or probangs containing some medicated liquid have been passed through the glottis and carried down into the bronchus of the affected side; all forms of inhalation have been used; and, finally, direct operative treatment by incision or puncture has been tried.

The first two of these methods—the introduction of liquids through the larynx and bronchi into the cavity, either by injection or by probang—have apparently been entirely abandoned. Ordinary inhalations, either by an atomizer or by the more simple inhaling tubes or bottles, do not seem capable of producing any positive or lasting effect. There is, however, one form of inhalation, more recently brought into use, that would appear to promise more favorably. I refer to methods of continuous inhalation, by which the patient is enabled to respire continually, by day and by night, an atmosphere charged quite strongly with alterative or disinfectant vapors. Two or three years ago, Dr. W. Roberts, of Manchester, England, described a simple portable "respirator inhaler," in the form of a metal box perforated in front and behind, and filled loosely with layers of tow on which the inhalation liquid was poured. This inhaler fits over the mouth, and is fixed over the ears like an ordinary respirator. A much more convenient form of apparatus for continuous inhalation has been devised and extensively employed by Dr. H. Curschmann, now of Hamburg. He has used it with great success in cases of putrid expectoration due to chronic bronchitis, and also where there has been destructive disease of the lung accompanied with offensive sputa. In at least one of his two most remarkable cases, I think, however, the physical signs are open to an interpretation different from that which he assigns, and one which renders the recovery of the patient less extraordinary.

I quote the following report of one of these cases: A man aged 53, who had been ill some months with symptoms of phthisis, was admitted under Dr. Curschmann's care in Nov. 1878, with

dulness, bronchial breathing, and medium-sized moist râles over the lower half of the right lung posteriorly. At one point percussion was tympanitic, and auscultation revealed signs of a cavity, which was proved to be such by tapping and drawing off some of its fetid contents. The patient expectorated about a litre of most intolerably putrid secretion in twenty-four hours. His evening temperature was 39° C., his pulse 112, and he suffered from night-sweats. He was treated throughout with almost continuous inhalations, first of oil of turpentine, and then of pure carbolic acid. In three weeks the sputa were quite free from smell, fever and night-sweats had left him, and he only spat up about one-third of the amount he had done on admission. As in the other case referred to above, there was ultimately extraordinary disappearance of the abnormal physical signs, and the patient gained twenty pounds in weight during his scarcely six months' stay in the hospital. Except a little morphia for the cough at the first, he took no medicine internally—no hypophosphites, no iron, no cod-liver oil. In both cases the successful result can be attributed to nothing except to antiseptic treatment—for such it is—by inhalation.

Since obtaining a supply of Curschmann's respirators from Berlin,[1] I have used continuous inhalation in a certain number of cases. There can be no doubt of its efficacy in destroying the putrid odor of the sputa in some cases of dilated bronchi or pulmonary cavity. It certainly exerts a modifying effect on the bronchial mucous membrane, and may be of material service in the treatment of obstinate bronchitis. I have seen unmistakable benefit from its use in cases of empyema discharging putrid pus through a pulmonary fistula. In cases of extensively diffused chronic catarrhal pneumonia, I have some interesting evidence pointing to the benefit that may possibly be derived from the continuous inhalation of suitable vapors. In cases of true pulmonary cavities, however, apart from the disinfection of their contents, it seems to be unsettled yet how far the condition of the walls can be modified even by this method of inhalation. It appears to be a subject deserving of thorough and prolonged investigation, and I am now engaged in carrying out observations on a number of suitable cases. The mode of using these respirators is very simple. The space between the wire disks

[1] This respirator is figured in the Berliner Klinische Wochenschr. No. 27, 1879, fig. 430; and can be obtained from H. Dunzelt, 22 Schaaren-Strasse, Berlin.

through which the air is respired, is filled with fragments of sponge on which the substances used for inhalation are poured. Those which have so far yielded the most satisfactory results are carbolic acid, creasote, oil of turpentine, a mixture of tincture of iodine and compound tincture of benzoin, and thymol. If care be taken to apply a little cosmoline to the skin where the rim of the inhaler touches the face, and to wipe the rim frequently, no local soreness will be produced. The vapors of these substances, even when dropped on the sponge undiluted, are tolerated with remarkable ease. Some patients become impatient of the constraint of wearing such a mask continuously, but as a rule, a clear explanation of the object in view, and the permission to leave off the respirator for a few hours each day, will overcome all such difficulties.

Admitting, therefore, that as yet, I know of no satisfactory evidence that the healing of pulmonary cavities can be positively favored by any method of inhalation, I will ask your attention to the results of treating such cavities by the direct injection of medicated liquids by means of a small syringe and delicate canulated needle.

In an article that appeared in the *American Journal of the Medical Sciences* for October, 1874, all of the questions connected with this subject were discussed by me at such length that it is now unnecessary to do more than refer briefly to a few points of interest.

In the *first* place, although the idea of opening lung cavities by an incision through the chest-walls is almost as old as Baglivi (possibly much older); still, owing to the very imperfect character of the early clinical records of thoracic diseases, it is difficult to show that such an operation was actually performed before the last century (Barry), or more probably the present one (Hastings and Storks).

Secondly. The idea of conducting continuous treatment of such cavities by local applications made directly through the chest-walls, has been seriously entertained only within the past few years.

Thirdly. That the possibility of penetrating the lung in a state of health with delicate needles without injury, was demonstrated in a few instances by the advocates of acupuncture; and more recently, in the lower animals, by Koch and others. I have myself repeated the experiment a number of times; and before

I ventured to inject iodine into the lung-tissue of the human subject, I made numerous injections of this substance into the lungs of healthy rabbits, which were killed at varying intervals afterwards, so that I was able to satisfy myself that not the least trace of irritation remained.

Fourthly. The operations of Storks and Mosler have shown that lung cavities are very tolerant of external interference, and that they may be cut down upon and opened, canulæ introduced and retained, and various medicinal agents injected in solution or spray (Mosler).

Fifthly. That the observations reported in full in my paper above referred to, have shown that the continuous treatment of lung cavities by repeated injections by means of delicate canulæ (a mode of treatment that had never been suggested until I practised it in February, 1874), may be conducted without severe pain, hemorrhage, traumatic irritation, or interference with internal medication and hygienic measures.

I proceed now to report in brief all of the cases in which this mode of treatment has been employed, in order to establish certain conclusions that would appear to follow.

CASE I. (No. II. in former communication.) John Wilson. Chronic phthisis; cavity at left apex, with disease of the lower lobe; seven injections of iodine into the cavity; temporary improvement in cough and expectoration; pneumonia of right lung from exposure, followed by caseation and softening; death. At the autopsy the *left* lung was much contracted, with dense pleural adhesions. On careful examination of the area through which the punctures had been made, it was impossible to detect any trace of the passage of the needle. A large anfractuous cavity existed in the upper lobe, divided into sacs by several imperfect septa. The various injections had entered the largest and most anterior of these sacs, the lining membrane of which was smooth, shining, and whitish.

CASE II. (No. III. in former communication.) Thomas Peyton. Chronic phthisis, with large circumscribed cavity at the right apex; two injections of iodine, without any unpleasant result, but treatment discontinued on account of nervousness of patient.

CASE III. (No. IV. in former communication.) Chronic phthisis, with large circumscribed cavity at the right apex; incipient disease at the left apex; forty-eight injections of iodine or of carbolic acid in the course of fourteen months.

William Sabin, æt. 29. Lame from coxalgia, and with strong hereditary disposition to phthisis, was attacked with cough in August, 1872, and in October had hæmoptysis; he lost flesh and strength, had marked hectic and dyspnœa, with troublesome cough and abundant purulent expectoration.

On physical examination, some roughness of breathing and a few crackling râles at left apex. On the right side tympanitic resonance from the clavicle down to the fifth rib. Cracked-pot sound existed from the second to the fifth rib; over the whole area, tubular or in places cavernous respiration, perfect pectoriloquy and gurgling râles. Unquestionably a large superficial cavity existed in right upper lobe. His treatment had been varied, but the course of the case had been downwards. He was in the Philadelphia Hospital, and during the continuance of the new treatment he remained under the same hygienic conditions. Injections into the lung cavity were begun February 24, 1874, and continued at intervals of about a week (with a break during my summer vacation) until April 11, 1875, a period of fourteen months. Forty-eight injections were given in all. The amount injected varied from ♏ iv to ♏ l; and the composition from three to twenty-five per cent. of Lugol's solution in water, or from two to three per cent. solution of carbolic acid. An aspirating pump was attached to the canula when the first few punctures were made, and on one occasion, a few drachms of blood flowed into the vacuum; but this never recurred, and the operation never caused any unfavorable symptoms. There were fluctuations in his symptoms, but on the whole his condition improved very decidedly. He gained in weight; the hectic fever ceased; cough and expectoration became comparatively trifling; dyspnœa diminished notably, and he became able to take much more exercise, walking over a mile at a time, and spending the greater part of every fine day out of doors, instead of being confined exclusively to the ward as he had previously been. During this period of fourteen months, marked changes occurred in the physical signs. There was little or no extension of the disease in the left lung. The right side underwent progressive contraction; the heart was

drawn over towards the right; and the signs of cavity grew more and more circumscribed, and less distinct.

Additional proof of the progressive contraction of the right lung and of the closure of the cavity was given by the fact that whereas at first it was perfectly easy to introduce the needle to a depth of two inches, to move its point about freely, and to inject f℥j of liquid, it became more and more difficult to make the injections, as the point of the needle became imbedded in dense tissue and the introduction of even a few drops of liquid met with very great resistance. The point of injection was repeatedly varied, so as to make sure that the above change was not the result of mere local thickening. By May, 1875, his cough and expectoration had almost entirely ceased, and he was discharged in an improved state of health to go to a Home for Consumptives in Boston. A few months after arriving there, signs of renal and hepatic disease appeared, and death occurred early in 1876 from ascites. Through the kindness of his physicians I secured the lungs. The left one was emphysematous and enlarged, with a limited amount of inactive disease at the apex. The upper and middle lobes of the right lung were reduced to less than one-third their normal size, and were for the most part converted into tough, non-crepitant, fibro-cellular tissue. On section, a small irregularly-shaped cavity, not more than two-thirds of an inch in its greatest diameter, was found in the anterior part of the lung, involving both the upper and middle lobes. Its surface was trabeculated, and covered with a smooth organized membrane. It was surrounded by a dense, fibrous, darkly-pigmented wall, which presented only a few indistinctly-marked streaks to indicate the lines along which the needle had been so frequently passed. Unquestionably all of the injections had entered the cavity; and it was impossible to avoid the conclusion that they had been instrumental in aiding the remarkable contraction and cicatrization of the large cavity that had occurred. Microscopic examination, conducted by Prof. James Tyson, showed that the condition of the wall surrounding the contracted cavity was one of interstitial inflammation, the alveoli being compressed and for the most part empty. The liver was displaced upwards, encroaching on the right thorax, so as to take the place of the retracted lung; and it, as well as the kidneys, was considerably enlarged. No special examination was made, but probably there was albuminous degeneration.

In this very unfavorable case there can, I think, be no doubt that the pulmonary injections were not only harmless, but positively beneficial.

Case IV. (No. V. in former communication.) Chronic phthisis of right lung, with large cavity at the apex; smaller cavity in lower lobe behind. Twenty-five injections of iodine. Relief of symptoms, and temporary improvement. Death from acute tuberculosis of left lung. Autopsy.

James Hill, æt. 27, with hereditary tendency to phthisis, began to cough in April, 1872, and first spat blood in following July. Subsequently he lost flesh and strength, had several hemorrhages, and was admitted to the Philadelphia Hospital in November, 1873. Physical examination showed contraction and impaired mobility of the right side of the thorax, with large cavity with thick walls at the right apex. Evidently marked pleural thickening over remainder of the lung, with some induration of its tissue. The heart was displaced towards the right. The left lung was hypertrophous and apparently healthy. No improvement showed itself between November and the March following, when the first injection was made. Twenty-five injections of dilute Lugol's solution (7 to 30 minims, 14 to 20 per cent. strength) were made between March 8 and Oct. 26, without the occurrence of even the least unfavorable symptom. Marked improvement in cough and amount of expectoration showed itself; and the physical signs indicated progressive contraction of the cavity at the apex. His general symptoms also improved, and he became able to take more out-door exercise. During the summer he continued in the hospital, and was attacked during my absence on vacation with severe purpura and diarrhœa. This was followed by signs of breaking down of lung tissue at the posterior part of right lower lobe, and about the close of October a rapid development of acute tuberculosis with pneumonia of the left lung occurred, and proved quickly fatal. Post-mortem examination showed that the body was still fairly nourished, with a good deal of subcutaneous fat. The right lung was small and contracted, being reduced to about one-half its size. Its tissue was thickened throughout. Over the anterior face of the upper lobe, opposite the second interspace where all the injections had been made, the pleura was greatly thickened, and on cutting into the lung a small cavity was found, with smooth lining membrane, com-

municating with a bronchus. The tissue around this cavity was very dense and tough, and undoubtedly marked contraction with diminution in the size of the cavity had occurred since he came under observation. No trace of the punctures remained. The lower lobe presented a small cavity in the posterior part. The left lung contained disseminated tubercles in upper lobe, with recent pleuro-pneumonia of the lower lobe.

In this case, as in the previous one, the prognosis was rendered unfavorable by the large size of the cavity and the implication of the rest of the lung, as well as by the hereditary predisposition of the patient, the frequent recurrence of hemorrhage, and the marked emaciation, dyspnœa, and prostration. On the other hand, the tendency of the disease to assume a fibroid form indicated a slow course. Until the severe failure of general health, with purpura and diarrhœa, occurring during the intense heat of midsummer, the course of the case had been for a number of months exceptionally favorable. Subsequently, the dyscrasia of the system showed itself by the breaking down of a new spot of lung tissue, and by the development of acute tubercular formation in the opposite lung. So far as the condition of the original cavity was concerned, it may be confidently stated that the injections not only were harmless while they seemed to afford some relief to the symptoms of irritation, but that they were instrumental in favoring cicatrization and contraction of the cavity.

Case V. (No. VI. in former communication.) Chronic phthisis: frequent hemorrhage; large cavity at right apex; injections of iodine; marked improvement. The full history of this case is given in my former article,[1] and as the patient passed from under observation soon after the date at which that was published, it is not necessary to reproduce it here.

The patient was 43 years old, with hereditary tendency to phthisis, and had presented symptoms of serious lung trouble for over three years. There was a large superficial cavity at the right apex, with a healthy state of the lower part of that lung: at left apex, there were signs of slight catarrhal trouble. Sixteen injections of iodine (♏xv to xxx; 10 to 20 per cent. Lugol's sol.) were made between April 9th and August 17th; during which time he took also cod-liver oil, and two ounces of whiskey

[1] Amer. Journ. Med. Sciences, Oct. 1874.

daily. He gained steadily in flesh and strength, and by the latter date was able to walk five miles a day without fatigue. The cough decreased rapidly and finally ceased, as did also the expectoration. At the time he left the hospital, August 19th, his general appearance was excellent; his appetite and digestion were good; he had gained from twelve to fifteen pounds. The physical signs indicated positive improvement in the condition of the right apex.

CASE VI. *Chronic phthisis: large cavity at right apex; disease of the lower portion of the lung; steady decline under general treatment; thirty injections of iodine; marked relief and temporary improvement. Subsequently, change of climate, dysentery, rapid decline, and death. Autopsy.*

Mr. L. had presented symptoms of phthisis for eighteen months, and under judicious general treatment had steadily failed, came under my care April 3, 1874. Cough very troublesome; sputa abundant. Physical examination showed a large superficial cavity in upper lobe of right lung. There were also patches of consolidation with beginning softening through the lower portion of the same lung. Dyspnœa marked and weakness extreme. He continued to take cod-liver oil and syr. ferri iodidi alternately. Thirty injections of iodine (♏x to l of a solution of ten to twenty per cent. Lugol's solution of iodine) were made into the cavity between Sept. 23, 1874, and April 19, 1875. No unpleasant symptoms followed in any single instance. The entrance of the injection was frequently proved by a strong taste of iodine in the mouth. During this time he improved slowly. On March 23, 1875, the following note was taken: much less cough and expectoration; appetite and digestion good; walks three or four miles every fine day; better than he was one year ago; no hectic; progressive contraction of the right chest, with drawing of the heart to the right, and evident contraction of the cavity in upper and middle lobes. No further injections were used. He went to the country about May 1st, but returned in August, feeling less well, with marked impairment of digestion from improper food. This was corrected with difficulty, and Nov. 1st he started for San Antonio, Texas, in good condition; the physical signs about the same. He was seized with dysentery, however, and never regained what he lost, but returned home in a greatly exhausted condition with chronic

dysentery and died Sept. 1, 1876. During the last two months of his life signs of scattered centres of disease in the left lung were noticed. Post-mortem showed some tuberculous nodules in the left lung. The heart was displaced towards the right, so that the right auricle was above and outside of the right nipple. The apex must have pulsated just at the right edge of the sternum. The right lung was bound down by dense fibrous pleural adhesions, which required to be cut. No trace of the punctures remained. The lung was very greatly contracted in all its dimensions. There were the remains of a huge cavity which had occupied the centre of the upper and middle lobes, but which was evidently much reduced in size by the contraction of the lung tissue; it had a smooth polished lining, with many trabeculæ and sacculations. The pulmonary structure surrounding it formed a wall half an inch or more in thickness; it was everywhere dense and fibrous, but especially so in the region of the injections where it had undergone advanced fibrous change. No evidence of fresh action in the right lung. I think it would be safe to say that in this case the relief afforded to distressing symptoms, and the improvement in the general condition during the continuance of the injections were marked; while the progressive change in the physical signs, confirmed later by the post-mortem examination, made it appear that the injections aided in causing contraction of the cavity.

CASE VII. Barney McDade, æt. 46, had been under observation for a number of years with fibroid phthisis of the right lung. This was deeply seated in the upper lobe, with extreme contraction of the side, displacement of the heart, and deviation of the trachea. In 1875, he began to have frequent hemorrhages, marked hectic, etc., and, after failure of usual remedies, two injections of dilute Monsell's solution were made into the right upper lobe. The tissues were found to be so dense, however, that it was difficult to effect the injections, and they were not repeated. At the post-mortem examination, the extremest lesions of fibroid phthisis were found.

CASE VIII. Mary Wiley, æt. 31, a frail, delicate woman, with hereditary tendency to phthisis, and broken down herself by repeated childbirths, came under observation in September, 1877, at the Philadelphia Hospital. Symptoms of phthisis for fourteen

months, several hemorrhages; very troublesome cough, often causing vomiting; f℥iv purulent sputa daily; pulse 120; respirations 45; weight 85 pounds, having lost 25 pounds of flesh; appetite so poor that little food and no drugs could be borne. Physical examination showed a very large cavity occupying the upper part of the right lung, with scattered moist râles through the lower part of the lung; left lung apparently healthy. In the hope of relieving paroxysms of cough, injections of dilute Lugol's solution (gtt x to xx; sixteen to twenty-five per cent.) were begun September 30, 1877, and twelve were used before the end of the year. The needle was introduced about one and a half inch; no difficulty whatever was experienced, and no unpleasant symptoms followed in any instance. On the contrary, very positive and decided relief was given. The expectoration diminished, the paroxysms of cough were much relieved, and the pains in the right chest became less severe. About January 1, 1878, she left the hospital to nurse one of her children who had been taken seriously ill. Although too weak to bear any exertion, she devoted herself to the care of her child for almost a month until its death; and then returned to the hospital to resume treatment. She was, however, so utterly exhausted that it was clearly unwise to attempt any such measure, and she sank in the course of a few days. Post-mortem examination showed a very large superficial cavity in the upper part of the right lung, into which the injections had all entered.

Case IX. Peter Dowley, æt. 37, admitted to the Philadelphia Hospital June 17, 1874. For nine years has had some cough, dyspnœa on exertion, and occasional hæmoptysis, but has worked steadily at his trade as a shoemaker. For the past three years, however, he has been failing, although the symptoms have presented many fluctuations. On admission he looked fairly well, and complained chiefly of the dyspnœa on exertion, and the paroxysms of cough: expectoration was quite copious. Cavity from left clavicle down to the third rib, with consolidation of the lung below that as far down as the sixth rib, anteriorly and posteriorly, over which area fine mucous râles were heard. There were also moist crackling râles over the upper lobe of the right lung, with broncho-vesicular breathing. Injections into the cavity were begun August 17th, and eighteen in all were used, between that date and January 4, 1875. He left the hospital very much

improved, and February 2, 1875, he returned to work. The first eight injections were, dilute Lugol's solution (♏ xx to xxx, twenty to twenty-five per cent.), the others were two per cent. solution of carbolic acid (♏ xx to xxx). No unpleasant symptoms attended any of the injections; and unquestionably they were serviceable in relieving the cough and in lessening the expectoration.

CASE X. A. B., a German, æt. 45, in the Philadelphia Hospital. Had suffered from an injury which had caused marked double lateral curvature of the spine, with contraction of the upper part of the right chest. He had presented the symptoms of chronic phthisis for about two years, and on examination a large superficial cavity was found situated in the upper part of the right lung. There was very little consolidation of the surrounding lung tissue, and no demonstrable disease of the left lung. He had lost about fifteen pounds of flesh, but still had a good appetite. The expectoration was very copious (Oss q. d.) purulent, and quite offensive; the cough was very frequent, and severe paroxysms frequently occurred. Twelve injections into the cavity were used, at first of dilute solution of carbolic acid; later, when the offensive character of the sputa passed away, of dilute solution of iodine. No unpleasant symptoms followed in any instance. Very positive relief was afforded to the cough; the sputa became inoffensive and reduced in amount to one-third or one-quarter of the former quantity; he gained flesh and strength, and was discharged to return to work.

CASE XI. Mr. M., seen in consultation with Dr. T. V. Crandall, æt. 47, with hereditary tendency to phthisis, and always of delicate health. He had catarrhal pneumonia in 1872 and 1874, followed by chronic phthisis of the upper part of right lung. Fistula in ano formed in 1875. His former weight was 160; in 1877 it was only 118. There had been four hemorrhages between April and October, 1877. A circumscribed superficial cavity existed in the right apex; and a few small centres of disease in the lower part of the left lung. His extreme debility, anæmia and emaciation, and the long-standing malnutrition rendered the prognosis eminently unfavorable; but the most careful and judicious treatment, including various forms of inhalation, having failed to relieve the terrible paroxysms of cough,

which very frequently caused vomiting, it was decided to attempt to modify the condition of the surface of the cavity by intra-pulmonary injections. Twenty-five injections in all were given in a period of seven months, from Oct. 1877, to May, 1878. Dilute solution of iodine (twenty to thirty per cent. Lugol's solution) ♏xx to xxx, was used in each instance. The entrance of the iodine into the cavity was often demonstrated by taste, odor of breath, etc. The injections frequently brought on immediately a paroxysm of cough, which could be allayed by fragments of ice and deodorated tincture of opium. All agreed that the treatment was successful in securing the desired result. The expectoration lessened, and the paroxysms of cough diminished greatly in frequency and severity. Progressive contraction of the right apex occurred, with condensation of the wall of the cavity and decrease in the size of the cavity itself. This was shown by the changes in the physical signs, and by the increasing difficulty in effecting the injections. Different spots of puncture had to be chosen, and finally they became so difficult, that it was decided to abandon them, as they appeared to have accomplished all that could be expected. In consequence of the greatly lessened frequency of vomiting his nutrition improved, and there was some gain in flesh and strength. Unfortunately other centres of disease became active, an attack of catarrhal pneumonia occurred in the lower lobe of the left lung, and he declined quite rapidly subsequently, and died towards the close of 1878. Undoubtedly the use of intra-pulmonary injections both prolonged life and greatly increased comfort in this case; while they exerted a beneficial effect on the lesions at the spot to which they were directed. An autopsy could not be secured.

Case XII. Mrs. J. D., æt. 52, had been a very hard working woman, and had borne many children. Soon after the menopause her health failed, and cough began, and when I first saw her symptoms of chronic phthisis had existed for more than a year. Her general symptoms were very unfavorable, although physical examination showed no disease save at the left apex, where there was a small superficial cavity, with consolidation surrounding and extending as low as the third interspace. Cough was very troublesome, and often induced vomiting, and the expectoration was viscid and muco-purulent. There were marked anæmia, debility, loss of flesh, hectic fever, sweatings, anorexia, and

mental despondency. Careful treatment, including change of climate, having been faithfully tried for many months, without affording relief to the symptoms or checking the progress of the disease, it was decided to use injections into the diseased area. The general symptoms justified a grave prognosis, and especially the fear of constitutional infection and outbreak of the disease in other localities. The result confirmed this apprehension. Fifteen injections were made into the left apex; and the notes of the case record marked relief to the cough, lessening of the expectoration, with evidences of arrested activity of the local disease, and tendency to contraction of the left apex. But ere long tuberculous formation made itself manifest at right apex, and extended rapidly through the lung. Intense cachexia was developed and death occurred. Here, as in Case XI., the local action of the injections was undoubtedly beneficial, but was exerted at too late a stage to secure as much good as might otherwise have been derived.

This comprises all the cases in which I have used injections into pulmonary cavities. Before attempting to sum up the result of the twelve cases, in which a total of 210 injections were made, I will report a few cases where injections were made into areas of partial or complete consolidation, in order to test the applicability of such local treatment to such cases.

CASE I. (No. 1 in former communication.) John Dortt: pneumonic phthisis, with caseous infiltration of entire left lung and secondary tuberculous formations in right upper lobe. The symptoms had lasted only nine months, but patient was sinking very rapidly. Five injections of dilute iodine solution were made in the course of sixteen days into the upper lobe of the consolidated left lung to the depth of one and a half inch. The punctures caused no symptoms whatever. Death occurred five days after last injection. Post-mortem examination showed no trace whatever of passage of needle through the intercostal tissues, nor of the punctures of the lung substance.

CASE II. Charles Johnson, a Swede, æt. 40, was admitted to Philadelphia Hospital Sept. 10, 1874. Symptoms of phthisis had existed for a year; cough, purulent sputa, numerous small hemorrhages: for six months there had been marked dyspnœa, and

rapid loss of flesh and strength. Examination showed a cavity in upper lobe of right lung, with infiltration of the entire lung, and with signs of breaking down of lower lobe in numerous points; also signs of scattered small centres of disease of left lung. Five injections of dilute Lugol's solution, or of two per cent. sol. carbolic acid were made to depth of one inch into right upper lobe between Oct. 1 and Nov. 1, 1874. After two injections pain was complained of, and on one occasion some sense of oppression. There was some apparent trifling relief to cough, but rapid decline continued, and death occurred Jan. 12, 1875. Post-mortem examination verified the diagnosis of the disease, and showed no trace of the injections.

CASE III. *Incipient Catarrhal Phthisis of Left Apex. Three Injections of Iodine.*

Charlotte Cummings, æt. 36, with hereditary tendency to phthisis, came under observation Oct. 10, 1877, with history of cough for five months, hæmoptysis, purulent expectoration, hectic fever, loss of flesh and strength. Physical examination showed marked impairment of resonance at left apex from clavicle down to third rib, with prolonged expiration and numerous fine crackling râles. Atropia, quinia, and paregoric were given. Three injections of dilute Lugol's solution of iodine (25 per cent. ♏x) were made into the first interspace at intervals of about eight days. She complained of some pain, but there was unquestionably relief to the cough, and when she passed from under observation soon after last injection, the râles were not nearly so numerous as previously, and her general condition was greatly improved.

CASE IV. Ellen Morrow, æt. 27, with hereditary tendency to phthisis, has had syphilis, and is of very intemperate habits. She came under observation Sept. 18, 1874, having had cough for two years, and one slight hæmoptysis. She was weak and anæmic, with dyspnœa on exertion. At left apex there were slight depression, lessened mobility, impaired resonance, prolonged expiratory murmur, and numerous crackling râles as far down as third rib. No disease of right lung. During the whole course of her treatment she was in hospital wards, under unfavorable hygienic conditions, and the only medicines administered were cod-liver oil, with occasionally pills of quinia, opium, and

digitalis. Intra-pulmonary injections were begun Oct. 17, 1874, and were continued at intervals of about a week or ten days, for nearly eighteen months. The needle was introduced to a depth of one to one and a half inch at various points in first and second left interspaces. At first ten injections of two per cent. sol. carbolic acid (♏x to xxxv) were used; for the remainder of the time dilute Lugol's solution of iodine was used. Fully forty-five or fifty injections were used in all. The case was in every respect an unfavorable one, and presented many fluctuations in its course. There was, however, a steady improvement in the physical signs, and by the end of the period named all evidences of active disease in the left lung had subsided. The retraction of the apex had increased, resonance was still impaired, and respiratory murmur was feeble, with prolonged expiration, but no râles could be heard, even on forced inspiration after coughing. She gained flesh and strength; cough and expectoration almost ceased, and she was able to leave the hospital and return to work. During 1876, 1877, 1878, and 1879, she remained fairly well, although she committed occasional excesses. In the latter year, after a severe exposure, she contracted renewed disease of left apex. Owing to unavoidable circumstances no injections have yet been used, although she has been very anxious to resume the treatment, being convinced of its great value to her formerly. When last seen in May, 1880, her general health was good, and the physical signs showed that the lung-tissue, at the left apex, possesses greater power of action than formerly.

Case V. Mr. Furrows, æt. 48, had suffered some years from chronic catarrhal phthisis, affecting both lungs, and associated with marked atrophous emphysema. The areas of disease were not large, and were much masked. All kinds of treatment proved unavailing to arrest the disease or to relieve the severe coughing and extreme dyspnœa. At his urgent request, eight intra-pulmonary injections of dilute solution of iodine were made, without any unfavorable or unpleasant effect, but with entirely negative results. Post-mortem examination about two months after last injection showed no trace whatever of them.

Having thus given a brief record of all the cases in which I have used intra-pulmonary injections, it remains only to state as succinctly as possible the practical conclusions that seem fairly

deducible. It is unnecessary to describe the mode of making the injections, further than to state that the syringe used is like an ordinary hypodermic one, only with a larger barrel, and a longer and even more delicate needle; that the skin at the point of puncture should be chilled by ice, so as to deaden the sensibility; that the amount of liquid to be injected must be determined by the tolerance of the individual case, the first injection being small in amount, say ♏v to x, and subsequent ones larger, ♏xx to xxx; and that the depth to which the needle is to be introduced must be governed by the thickness of the chest-walls and the deep or superficial position of the lesion, varying in different cases from three-fourths of an inch to two inches. The only liquids I have used to any extent have been dilute solutions of iodine and of carbolic acid. The strength of the latter was uniformly two per cent.; while for the iodine, Lugol's solution (the liq. iodinii comp.) was used in proportions of one part to from three to twenty parts of water. In a previous communication already referred to, other liquids were suggested as possibly available. Only one of them, dilute Monsell's solution, has been tried, and that but imperfectly in two instances.

It may probably be assumed that the effects of such intra-pulmonary injections may be learned from the record of 291 distinct injections, in 17 distinct cases of very varied character.

The dangers that might be feared from their use are: from the effects on the layer of tissue traversed by the needle before reaching the seat of lesion; from the escape of liquid from the lung through the opening made by the needle in the pulmonary pleura; and from hemorrhage from the pulmonary tissue, or from the surface of the cavity. In regard to the first point, it may be stated that, in cases where the cavity is not superficial, no injurious effects whatever have been noticed, whether the intervening layer has been of vesicular structure, of cheesy exudation, or of organized fibro-cellular tissue. In regard to the danger of liquid (blood, pus, softened cheesy exudation) escaping through the minute puncture into the pleural cavity, and exciting inflammation, it may be stated that, while in nearly every case of pulmonary cavity there are adhesions at the point of puncture, all the evidence goes to show that even without such adhesions, not even the most trifling escape of any such liquid actually occurs; or if it does, that it excites only local adhesive inflammation of a rather beneficial and protective character. In regard to the danger of

hemorrhage, I may confidently repeat the opinion formerly expressed after sixty-five injections had been made, that with ordinary care there is no danger of any serious bleeding. In fact, in only a single instance, where the puncture was made with a vacuum (Dieulafoy's aspirating syringe) connected with the canulated needle, has any hemorrhage whatever occurred. Rarely only have the first few sputa expectorated after the puncture been slightly blood-stained. The only unpleasant results that may follow such injections are, paroxysms of cough, and a certain amount of pain, though either of these very rarely occurred to such a degree as to constitute an objection to the mode of treatment. When severe spells of coughing did occur, they yielded to the action of ice held in the mouth, or to a small dose of chlorodyne or deodorized laudanum. The pain caused was, as already stated, rarely bad enough to call for relief; in a few instances where it did, a small dose of morphia hypodermically promptly allayed it.

If it can be shown, then, that such injections are practically free from all danger or serious inconvenience, it remains to be asked what indications present themselves for their use, and to what extent they are capable of meeting these indications.

These questions have, however, been so fully discussed in my previous article on this subject (q. v.), that I shall limit myself here to a bare mention of the different points.

The chief indications that present themselves for treatment in connection with pulmonary cavities, are:—

1. The disinfection of their contents.
2. The relief of cough.
3. The diminution of secretion.
4. The modification of the morbid action of the lining surface of the cavity, so as to favor cicatrization and contraction, and the prevention of infection of the constitution.

In addition to these, it would be desirable to secure free and easy escape of the contents, and to afford rest to the cavity by avoiding the necessity of coughing to discharge the secretions; and by relieving tension of the walls, so as to allow partial collapse of the cavity under atmospheric pressure. When a large canula is introduced and allowed to remain permanently in the cavity—as was done by Storks and more recently by Mosler—the latter objects may be secured to some extent; but

it seems that the very serious traumatic effects of such an operation more than cancel this advantage.

In regard to those first mentioned, however, it appears to me, both from general considerations and from the clinical records I have here submitted, that intra-pulmonary injections are capable of affording material aid in suitable cases.

In but a few of the instances where I have used them were the sputa of such an offensive character as to require the special use of disinfectants. But the injection of a dilute solution of carbolic acid was found to exert a prompt influence in removing fetor where it did exist.

As already stated, the entrance of the liquid into the cavity will occasionally excite a paroxysm of cough, rarely of long duration; but in every instance where this mode of treatment has been pursued, very considerable relief has been afforded to the cough, and the amount of expectoration has become notably diminished. In several cases these results followed in a really surprising degree.

I shall not repeat the lengthy consideration into which I have already entered,[1] as to the possibility of such injections modifying the morbid action on the surface of and in the tissue immediately surrounding a pulmonary cavity; since my object now is merely to call attention to the results of experience in this direction. It seems, then, that in no instance did the passage of the delicate needle excite any injurious or destructive action in the tissue traversed; that the lining membrane of the cavities into which numerous injections had been thrown, presented a highly favorable appearance, indicative of an arrest of ulceration and a marked tendency to reparative action (see particularly Cases Nos. I., III., IV., VI.); and that in a certain number of cases the conditions of the surrounding lung tissue showed clearly not only an arrest of progressive disease, but a marked tendency to the development of fibro-cellular tissue so as to circumscribe the cavity and tend towards its contraction and cicatrization. (See particularly Cases III., IV., VI.)

Finally, it remains only to consider in what cases such injections are applicable and most likely to be of service.

It will of course be understood that it is not assumed that the positive value of this mode of treatment has been definitely determined by the experiences here narrated. But as they are

[1] American Journal of Medical Sciences, October, 1874, p. 324.

sufficiently numerous to serve as the basis of some general deductions, and as their generally favorable character indicates that it is important that further observations shall be conducted, the following suggestions may be briefly stated:—

Cases of single, superficial, and circumscribed cavity with comparatively little surrounding disease, and without implication of the other lung, are best adapted for local treatment by injections.

Cases of cavity, with extensive disease of the surrounding lung or of the other lung, hold out no prospect of permanent benefit from local treatment; but, nevertheless, much relief may be afforded to certain symptoms, as frequent paroxysmal cough connected with efforts to empty the cavity, or fetid expectoration.

In cases of extensive consolidation of lung tissue, there is no good to be expected from injections into the diseased area.

In cases where there is circumscribed partial consolidation—as in the first stage of catarrhal phthisis—which persists obstinately and tends to spread despite the use of other measures (hygienic care, change of climate, suitable internal medication, etc.), or, where the most important of these favorable influences cannot be secured, injections of medicated liquids into the diseased tissue may be tried with propriety.

It will thus be seen that more extended experience has amply confirmed the conclusions reached in 1874.[1]

[1] Loc. cit., p. 341.

ÆTHER HYDROBROMICUS—BROMIDE OF ETHYL.

Formula C_2H_5Br. Molecular Weight, 109.

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HISTORY OF THE PREPARATION.

Hydrobromic ether has now acquired considerable reputation as an anæsthetic. It was discovered by Serullas, in 1827, but attracted no special attention until Dr. Nunnelly, of Leeds, made some experiments with it on animals, and published them in 1849 (*Transact. Provincial Association*). Dr. Nunnelly brought this and another agent again before the profession, and read a paper before the British Medical Association in 1865, a report of which was published in the journal of that association, in which it was stated that he had used either hydrobromic ether or chloride of olefiant gas, in all the principal operations at the Leeds General Eye and Ear Infirmary, but his experiments were not corroborated by any one else. "This was, as well observed by a recent experimenter,[1] at a time when chloroform held such complete sway in England, that no importance was attached to Nunnelly's experiments, and he had no followers." In 1876, some experiments were made with it in France, by Rabuteau, on the lower animals, but evidently without a knowledge of the fact that this had been done previously in England. I was the first again to make known the anæsthetic properties of hydrobromic ether to the profession.

Without the knowledge that Dr. Nunnelly had performed any experiments on animals or man, I had the ether made by Mr. Joseph R. Remington, a chemist of Philadelphia, in July, 1877, and first placed dogs, cats, frogs, and pigeons under its anæsthetic influence, and found them to recover promptly. I then

[1] Dr. Marion Sims, Medical Record, New York, April 3, 1880, p. 361.

subjected myself to its anæsthetic properties, and discovered at times an increase of the pulse and respirations, but not any disagreeable symptoms, except those reported by me.[1]

After fully satisfying myself of its efficiency and safety as an anæsthetic, I laid the following statement before the Medical Society of the State of Pennsylvania, at its annual meeting held at Pittsburgh, May, 1878, having arrived at the following conclusions, which were published in the Transactions of that year.

"In ten cases, the shortest time required to place a patient under hydrobromic ether was thirty seconds; longest time, four minutes; average time, one minute and a half. Vomiting occurred in three cases out of the ten, when food had been taken prior to the use of the agent. Excitement (hysterical) in two cases; prostration in one case; no asphyxia or fainting. The advantages of this agent over other anæsthetics is the rapidity of its elimination from the system by respiration, with increase of pulse and respiration.

Action on the Lower Animals.—Hydrobromic ether produces absolute anæsthesia with dogs, rabbits, and frogs, in a shorter period than even chloroform or ether. There is a pricking feeling of the skin at the elbow, and in the hands, with a rapid loss of power to move. The brain is comparatively free, the pupils are not much affected; the skin, in some few instances, is cold and moist, but in the majority of cases, natural.

It differs from ordinary ether in the stage of excitement being shorter, the sedation and the subsequent elimination more rapid."

My next contribution, comprising twenty-five cases, was published in the second edition of my *Manual of Anæsthetics*, 1879, p. 295. I first noticed symptoms of great rigidity; and it required ℥j of hydrobromic ether to bring the patient under anæsthetic influence. This condition I have noticed as a peculiarity in certain cases, the effects resembling those of nitrous oxide gas. The number of cases in which it was used began to increase rapidly, and in September, 1879, I reported one hundred cases at Amsterdam, at the meeting of the Medical Congress of all Nations. On my return, the number, after a few months, had rapidly increased by other operators all over the country. I found that this agent was being made by two or three chemists, but some of the specimens were not pure, and contained a

[1] A Manual of Anæsthetic Agents, 1st edition. Lindsay & Blakiston, March, 1878.

heavy distillate, which caused the ether to have a disagreeable odor and taste.[1] In January, 1880, the writer read a paper before the Philadelphia County Medical Society on the new anæsthetic, which was published in the Phila. *Med. Times*.

The following were my statements in regard to the anæsthetic as compared with certain others now in use by the profession.

"Hydrobromic ether possesses the following properties:—

1. It is an anæsthetic, which, *with care*, may be safely administered to man and animals.

2. It is more rapid in producing anæsthesia than even chloroform, and is eliminated by respiration and the kidneys, more rapidly than any other of this class of agents.

3. The heart and respiration are but very slightly affected, unless *employed in excessive quantities*.

4. Vomiting is more rare than with ether or chloroform.

5. Owing to its odor being more rapidly removed, it can be used with comfort in a private office, or the patient's chamber; and, as a rule, the odor is more agreeable than that of ordinary ether.

6. Hydrobromic ether not being inflammable, and producing its anæsthetic influence on the muscles of the throat, any operation can be performed on the mouth and throat with satisfaction to the surgeon, and comfort to the patient.

7. In vivisection, it acts more promptly than ether upon animals, requiring, as a rule, only two minutes to bring a dog under its influence, and it is not fatal like chloroform."

How often was there nausea and vomiting during the administration of hydrobromic ether? In one hundred cases, there were *twelve cases* of slight *nausea* after the operation, and eight cases of vomiting during the operation; but always where the patient had partaken freely of food of a solid character, just prior to the use of the anæsthetic.

Asphyxia.—This disagreeable and painful symptom was not noticed in any of the cases.

Fainting.—In no instance was there any evidence of fainting.

Hysterical Excitement, or rigid Muscular Spasm.—This was noticed in some six cases, but soon passed away, leaving no bad symptoms.

Prostration.—In four cases there was *some prostration evinced* by *cold moisture* on the *hands and face*, but *of very short duration.*

[1] Anæsthetic Manual, 2d edit., p. 294.

The rapidity *with which the patients came under the anæsthetic influence of hydrobromic ether.* Ten cases in one minute and a half, twenty in two minutes, ten in two minutes and a half, forty in three minutes, ten in four minutes, ten in five minutes.

How long did it take to recover consciousness from the effects of the hydrobromic ether? In fifty cases from two minutes to two minutes and a half; in thirty cases, three minutes; and in twenty cases, four and a half to five minutes. Struggling, coughing, or gagging, which occurs so frequently during etherization, was very rare under the anæsthetic influence of hydrobromic ether. This form of anæsthetic is not apt to produce headache.

Hydrobromic Ether as an Anæsthetic in Labor.—In some instances, in labor, both ether and chlorform will produce, in certain females, so much relaxation of the sphincters, that if there is the slightest tendency to hemorrhage, it will be very much increased. To test the influence of hydrobromic ether, I administered it February 24, 1880, to Mrs. R. T. P., aged 30, a lady with a narrow pelvic outlet, and very rigid os uteri, who had been in labor with her fourth child for nine hours, having made but little progress. The hydrobromic ether was used in tablespoonful quantities, when the pains were most intense and distressing, and gave as prompt relief as ether, and yet it did not interfere in the least with the expulsive efforts. Her pulse was only increased six beats; no apparent disturbance of her respiration, only a feeling of fulness in the chest. The baby, a female, was born, full of life and vigor, and cried lustily. There was a slight laceration of the perineum, as the occiput was pressed strongly upon the tissues. The patient had not a bad symptom from the use of this form of anæsthetic, and there was no sickness of the stomach. The whole quantity employed was five tablespoonfuls. There was no hemorrhage, and the placenta was expelled with but slight traction. This is the first time that I am aware of this agent having been employed for this purpose. In a second case I employed this anæsthetic with a like good result; and it has been employed by others.

Method of Using it.—The hydrobromic ether is best given in a folded, starched napkin, so as to cover the face, and inside that a soft pocket handkerchief, or second napkin. Twice I have found that, unless the first drachm was crowded upon the patient, it is apt not to act promptly. This has been the cause of failure in two or three instances, in the hands of able surgeons.

I have met with one or two specimens of hydrobromic ether which, on standing, would become brown, from free bromine; some of the specimens also had a most disagreeable odor of bromoform, and others of free phosphorus. Another specimen was mixed with ordinary ether, and would explode and burn. One of the greatest advances in its use by the profession was the obtaining of a formula free from the explosive article, phosphorus, and furnished at a moderate cost; the full formula will be found in my work. This process of De Vrij, by decomposing potassii bromidum with sulphuric acid, which process was modified by Dr. Greene, has since been changed, so as to obtain a larger quantity, by Dr. L. Wolff, who recommends the use of a larger quantity of sulphuric acid and water, with ferri bromidum, on account of its cheapness, and its distillation at a lower temperature (about 200° F.), and throwing away the very first and latter part of the product.

In April, 1880, there was published[1] a valuable article on bromide of ethyl, or hydrobromic ether; its physiological action. The author in his experiments agrees with those made by Nunnelly, Rabuteau, and myself, both on animals and man, and his conclusions are, we consider, those that would naturally flow from his experiments. I will, therefore, give his experiments, with the feeling that they will be of interest in this connection.

"The period in which anæsthesia was produced, according to Dr. Turnbull, varied from thirty seconds to four minutes, the average time being two minutes. The quantity required for an anæsthetic effect was from a drachm to half an ounce. In some cases it produced vomiting, excitement, and prostration, but neither syncope nor asphyxia was seen to take place. In dogs, rabbits, and frogs, it had a rapid action.[2]

The fact that bromide of ethyl is an anæsthetic less dangerous, and at the same time quicker, than chloroform and ether, makes it a drug of vast importance both to the profession and their patients. On this account, I have thought it worth my time to make a more critical analysis of its action upon the nervous, cardiac, and respiratory apparatuses. My experiments

[1] Bromide of Ethyl: its Physiological Action. By Isaac Ott, A.M., M.D., late Lecturer on Experimental Physiology, University of Pennsylvania. Reprint 16 pp., from Detroit Lancet. Geo. S. Davis, publisher.

[2] Philadelphia Medical Times, Jan. 1880.

were performed upon the lower animals, frogs and rabbits. To irritate, I employed a Dubois induction apparatus, run by a small carbon-zinc cell. The electrodes were those of Ludwig.

MOTOR NERVES.

To study the action on motor nerves, frogs were selected, and, after apparent death, the sciatic nerve was bared, and its irritability tested by the faradic current. The weakest current that would cause a muscular contraction was taken as a test.

Experiment I. (frog).—Was ethylized till completely relaxed, apparently dead; the sciatic was bared, and its irritability tested by the faradic current; the foot began to twitch with the secondary coil, at 265 millimetres. This experiment demonstrated that the paralysis did not ensue from a loss of power in the motor nerves. After the apparent death of the frogs, they finally recovered all their functions.

MUSCLE.

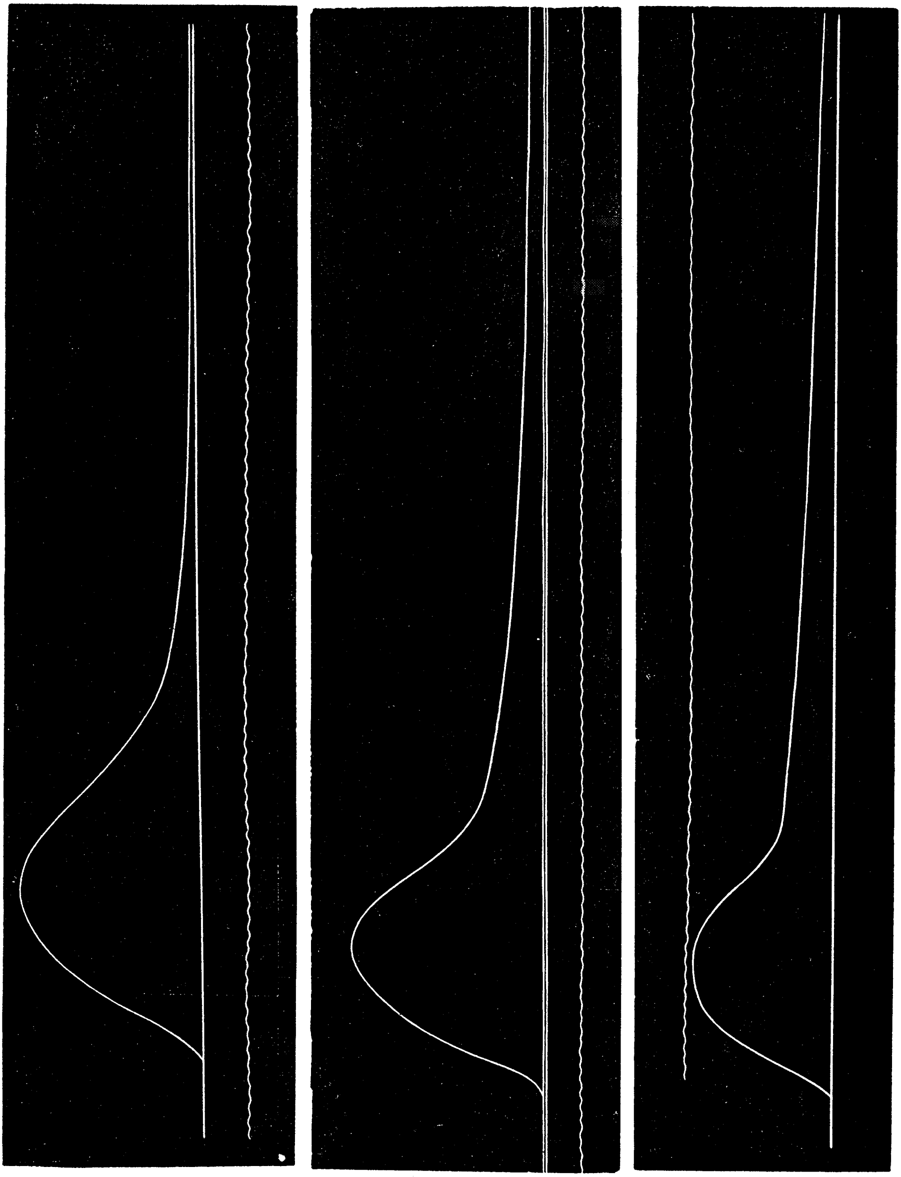
Upon striated muscle, bromide of ethyl has the power to lower the irritability. Thus, when curves are taken of a muscle, the height of the curve seldom reaches that of a normal curve. To take the curves, I employed a myograph of Marcy, the muscles being loaded with a weight of ten grammes. This instrument inscribed its tracings upon the cylinder of a Marcy-Secretans apparatus. The time was registered by a tuning-fork, registering 120 double vibrations, being run by a large Daniell cell. As is seen in Fig. 2, the ascent of the curve is normal, the summit slightly larger, and the descent considerably prolonged. Direct irritation was employed. Figs. 2 and 3 represent the effect of ethyl, Fig. 1 the normal muscle curve.

SENSORY NERVES.

To test the action of the sensory nerves, I employed the following method:—

Experiment II. (frog).—Had his right thigh ligatured, excepting the sciatic, then his nose was plunged into the vapor of bromide of ethyl. In a few minutes he was completely relaxed. Upon pinching the right foot, no movement ensued; the same result ensued with the other feet. The lymph hearts continued beating during the anæsthesia.

Fig. 1. Fig. 2. Fig. 3.



EXPERIMENT III. (frog).—His abdominal aorta was ligated, and his nose plunged into the vapor of ethyl for a few minutes, when he was completely anæsthetized. Upon pinching his feet, or irritating them electrically, no movement followed in any ex-

tremity, although each extremity was irritated. As already demonstrated, the motor nerves remained irritable, whilst the muscles were somewhat affected, yet not so much that they would not contract upon an impulse being communicated to them through the motor nerves. The experiments above demonstrate that the sensory nerves are not affected. They convey impressions to the spinal cord, but this organ takes no cognizance of them, or, if it does, we are unable to evolve any proof of this cognizance. This brings us to the consideration of the spinal cord itself.

EXPERIMENT IV. (frog).—His spinal arteries coming from the abdominal aorta were severed, and his nose was plunged into the vapor of bromide of ethyl. The reflex movements of the posterior extremities continued a considerable time after they vanished in the anterior ones.

As already stated, the seat of the paralysis is neither in the motor nerves, muscles, nor sensory nerves, but in the spinal cord. Experiment IV. also confirms this view, for here the ethyl only reached the upper segment of the spinal cord at first, but, by its volatility it was diffused finally through the whole cord.

REFLEX ACTION.

In the study of reflex action I employed Türck's method. The frog was suspended by a wire holder, and its foot immersed in a solution slightly acidulated by sulphuric acid, and then the acid was immediately washed off. The time was noted by a metronome, beating ninety times per minute. The cerebrum was always ablated, and the animal permitted to recover.

EXPERIMENT V. (frog).—Medulla separated from the cord.

Time.		Metronome beats.
1.40 P. M.	. . . .	8
1.45 "	about 5 drops of ethyl subcutaneously.	
1.46 "	. . . .	13
1.51 "	. . . .	18
1.56 "	. . . .	21
2.04 "	. . . .	30
2.09 "	. . . .	30
2.25 "	. . . .	17
2.30 "	. . . .	17
2.35 "	. . . .	18

EXPERIMENT VI. (frog).

Time.		Metronome beats.
—		12
2.46 P. M.	Two drops of ethyl subcutaneously.	
2.48 "	. . . .	17
2.55 "	. . . .	17
3.00 "	. . . .	17
3.05 "	. . . .	22
3.10 "	. . . .	23
3.15 "	. . . .	30
3.20 "	. . . .	38
3.30 "	. . . .	70

As seen, ethyl depresses reflex activity quite as actively as when the centres of inhibition are in activity. It must necessarily have little or no action on the centres of *Setchenow.* This depression of reflex activity is not a result of weakened circulatory activity, for the heart-beat is still frequent and active.

ACTION ON HEART AND BLOODVESSELS.

On frogs it at first slightly increases, and then decreases the pulse rate.

EXPERIMENT VII. (frog).

Time.		Heart beats per minute.
11.35 A. M.	. . . .	32
11.37 "	ethyl subcutaneously.	
11.38 "	. . . .	32
11.40 "	. . . .	32
11.42 "	. . . .	32
12.05 P. M.	. . . .	31
1.27 "	. . . .	32

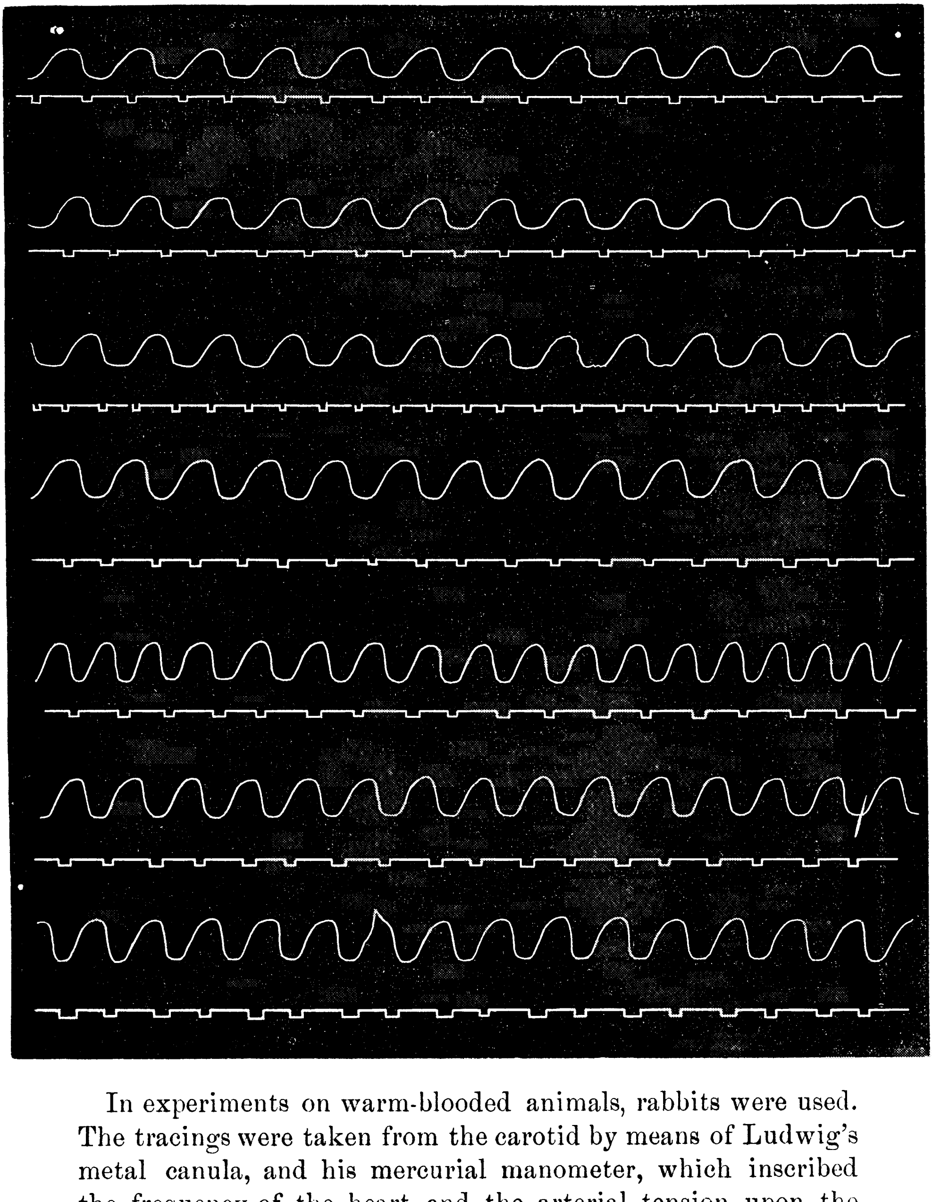
EXPERIMENT VIII. (frog).

Time.		Heart beats per minute.
12.12 A. M.	. . . .	56
12.13 "	ethyl subcutaneously.	
12.15 "	. . . .	56
12.19 "	. . . .	57
12.27 "	. . . .	54
12.34 "	. . . .	44
1.10 "	. . . .	36

Fig. 4 also shows the effect on the power of the heart. The lever was a light one, and placed across the heart, inscribing on a revolving drum. One-second markings are beneath each record. In the third row of tracings from the base of the figure, the increase is seen. The first row of tracings was the normal

one. The topmost row shows the weakened force of the heart, the lever not being elevated as high as usual.

Fig. 4.



In experiments on warm-blooded animals, rabbits were used. The tracings were taken from the carotid by means of Ludwig's metal canula, and his mercurial manometer, which inscribed the frequency of the heart, and the arterial tension upon the drum, run by the registering apparatus. The rate of movement

of the drum was noted by an electro-magnet, whose pen wrote the records. The interruption of the current was produced by Ludwig's clock arrangement. To administer ethyl, a Woulff bottle was used, the ethyl being placed in it, and the inspired air coming through the cavity of the bottle. It was attached to Ludwig's tracheal canula, by means of rubber tubing. To keep the artificial respiration, a Backus water-motor was used, which ran a large wheel, whose eccentric squeezed a bellows in a very regular manner. It has been more accurately described at another place. The pulse and pressure are always given for fifteen seconds.

EXPERIMENT IX. (rabbit).—Tracheotomy performed, carotid used.

Time.	Pulse.	Blood-pressure.
1.30.00	44	116
	Bromide of ethyl by inhalation.	
1.30.15	48	116
1.30.30	47	116
1.30.45	53	118
1.31.00	54	136
1.31.15	60	118
1.31.30	45	118
1.31.45	55	118
1.32.00	55	118
1.37.00	58	116
1.38.00 inhalation of ethyl stopped.		
1.49.00 ethyl again.	47	130
1.49.15 ethyl again.	51	130

This experiment demonstrates that bromide of ethyl increases the frequency of the heart and the arterial tension. Care was taken in the method of inhalation, that commencing asphyxia was not induced, free access of air being given. The question now arises, whence does this increase of frequency come? Is it a paralysis of the central system, or peripheral inhibition of the pneumogastric over the heart that causes it? Or, is it due to a stimulation of the cardio-motor ganglia? Certainly, the increase of arterial tension is not sufficient to increase the cardiac activity. Or does the cutting off of impressions through the sensory nerves upon the cardio-inhibitory centre, in the medulla, reduce the power of inhibition? That this is not the case, can be proved by division of the vagi, when the increase still takes place.

EXPERIMENT X. (rabbit).—Vagi divided, atropia given by the vein.

Time.	Pulse.	Pressure.
1.15.00	53	90
Bromide of ethyl during the whole observation by inhalation.		
1.15.15	53	90
1.15.30	60	90
1.15.45	57	94
1.16.00	58	100
1.16.15	53	100
1.16.30	57	102
1.16.45	59	103
1.17.00	58	98
1.17.15	58	100
1.17.30	53	100
1.17.45	58	98
1.18.30	57	102
1.26.00	54	90

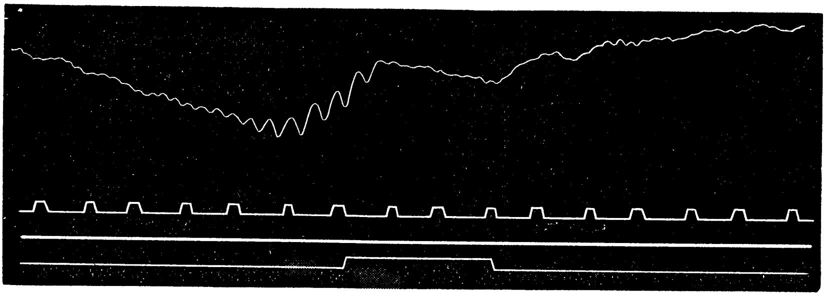
EXPERIMENT XI. (rabbit).—Vagi paralyzed by atropin, proved by faradic stimulation; tracheotomy, no artificial respiration.

Time.	Pulse.	Pressure.
1.50.00	58	58
1.50.15	58	44
1.50.30	56	44
1.50.45	60	54
1.51.00	59	45
1.51.30	56	44
1.52.00	53	38
1.53.15	56	38
1.58.00	56	42

In these experiments, neither section of the vagi, nor paralysis of their peripheral ends, prevented the increase of cardiac frequency, nor the rise in arterial tension. It must be due either to a stimulation of the accelerative nerves, or the cardio-motor ganglia. It certainly did not act through the accelerators of the vagi, as they were divided. The same may be said of section of accelerators, after division of the spinal cord. If the drug acts upon the accelerators, it must act on their fibres, or in their transit, or on the ganglia in which they end. But the general inactivity of the accelerators makes it improbable that they have anything to do with it. It, more likely, is due to the direct stimulation either of the cardio-motor ganglia, or the cardiac muscle itself. That it did not itself paralyze the vagi

was shown by an experiment where faradic stimulation still arrested the heart of an animal, when thoroughly under the ethyl. This is shown in Fig. 5, the break in the lowest line indicating the time of stimulation, the next line the abscissa, and

Fig. 5.



the slow beats in the highest curve the effect on the cardiac frequency.

As to the increase of arterial tension, it is not due to a stimulation of the vaso-motor centre, for, after removal of this centre, the increase still ensued.

Experiment XII. (rabbit).—Vagi cut; spinal cord cut between atlas and occiput, verified by post-mortem; artificial respiration.

Time.	Pulse.	Blood-pressure.
1.20.00	26	26
	Ethyl during the whole experiment.	
1.20.15	29	30
1.20.30	37	29
1.21.00	28	28
1.21.15	29	24
1.21.30	30	24

This experiment demonstrates that the rise of arterial tension is due either to a stimulation of the spinal vaso-motor centres, or of the peripheral vaso-motor system.

RESPIRATION.

To study the effect of the drug upon the respiration, I employed a T-shaped canula, one arm of which communicated with Marcy's tambour, which inscribed the respirations upon the drum of Ludwig's registering apparatus, and the other arm communicated with the inhaler.

EXPERIMENT XIII. (rabbit).

Time.	No of respirations per 15 seconds.
Ethyl by inhalation.	
—	11
2.1.00	10
2.1.15	10
2.1.30	11
2.1.45	11
2.2.00	11
2.2.15	10
2.2.30	11
2.2.45	7
2.3.00	9
2.4.00	12
2.4.15	12
2.5.45	12
2.6.45 ethyl removed	
2.6.45	13
2.8.00	12

As is seen, it reduced the respirations from eleven to seven. This decrease was not affected particularly by section of the pneumogastrics. It increased, however, the depth of the respiration. The drug evidently decreases the activity of respiration by an effect on the central ganglia. Care was taken that a free access of air was permitted to enter the lungs. These experiments prove that the danger from the side of changes in the respiratory and cardiac movements, as compared with ether, are quite small; it more nearly resembles nitrous oxide, and certainly may supersede the latter in its use by the dental profession. Its dangers are, if anything, less than those occasioned by nitrous oxide, whose use is generally accompanied with considerable asphyxia. The great arterial tension induced by nitrous oxide is more apt to produce cerebral trouble than the slight increase caused by bromide of ethyl. As to its proximate cause in the production of anæsthesia, it is undoubtedly by a chemical action upon the gray matter of the nervous system. Asphyxia has no part in it. If we compare its action with other anæsthetics, as ether, chloroform, and nitrous oxide, it will be found as follows:—

1. Chloroform increases the pulse, then slows it by cardio-inhibitory stimulation; ether increases the pulse; nitrous oxide also increases it by paralysis of the cardio-inhibitory apparatus; whilst bromide of ethyl increases the pulse by an action upon the heart itself.

2. Chloroform reduces blood-pressure by paralysis of the main vaso-motor centre and cardiac debility; ether greatly increases it, and keeps it increased; and nitrous oxide also increases it. Bromide of ethyl increases it either by stimulation of the spinal or peripheral vaso-motor system.

3. Chloroform increases and then decreases respiration; nitrous oxide reduces it; bromide of ethyl decreases it by central action."

On April 3, 1880, there was published by the distinguished surgeon, Dr. J. Marion Sims,[1] of New York, a paper on bromide of ethyl as an anæsthetic, in which the death of a young lady of Florida was ascribed to its use, full details of which I here give, omitting only the preliminary history of the anæsthetic.

"Miss B., of Tallahassee, Florida, twenty-five years old, in perfectly good health, had been subject to epileptic attacks for the last five years. They came regularly on the fourth or fifth day after the cessation of the menses. Menstruation was scanty, lasting but two days. She had retroversion, and the right ovary was enlarged and painful on pressure.

Bromides had been largely used without any permanent improvement; afterwards the cervical canal was enlarged by an incision, then menstruation became normal in quantity and painless, and yet the post-menstrual epileptic seizures were not modified in the least. Her physicians, Dr. Betton and Dr. Bond, had advised Battey's operation, and from my failure to give her any relief by the tentative efforts just alluded to, I did not hesitate to advise her to submit to Battey's operation, and it was performed on Monday, February 9, 1880.

Everything being ready, a drachm of bromide of ethyl was poured on a folded napkin and held closely over the mouth and nose. In a minute more another drachm was poured on the napkin, and at the end of two minutes she became insensible and relaxed; but the conjunctiva was sensitive to touch, and her eyes rolled about, and her breathing was very rapid. At the end of five minutes (the hydrobromic ether added as required), she was perfectly insensible, and breathing sixty times a minute. This very rapid breathing would moderate whenever the ether napkin was removed, so as to admit pure air, and would always increase by pouring fresh ether on the napkin.

[1] New York Medical Record, April 3, 1880.

At the end of ten minutes she could be kept quiet, breathing softly and regularly, but always above the normal standard. The pulse was now 86, full and strong. During the first twenty minutes we had used about two ounces of the hydrobromic ether. At that time she vomited freely the contents of the stomach. At the end of forty minutes she vomited again, with severe straining.

On three occasions during the operation there was considerable opisthotonos, with twitching and rigidity of the muscles of the extremities, and constant rolling of the eyes in all directions.

Dr. Nash thought these were similar to her epileptic attacks, in one of which he had seen her.

The operation lasted an hour and a half. Her condition was good during the whole time, and her pulse was strong and full. The rapid short breathing was a peculiar feature; the sensitiveness of the conjunctiva continued from the beginning to the end of the operation, and her eyeballs were in almost constant motion. There was no unusual dilatation of the pupils. In all about four and a half or five ounces of the ethyl were used.

She recovered quickly from the anæsthetic after being put to bed, but she had the most distressing retching and vomiting imaginable. The straining was so violent that Dr. Nash more than once placed his hands over the abdomen to prevent the wound from bursting asunder. From the moment of returning consciousness she complained of violent pain in the head, and to relieve this pain, she got a fourth of a grain of morphia hypodermically. In an hour this was repeated. Two hours after the operation (6.30) the pulse was sixty, full and strong.

6.15 P.M. Distressing retching and vomiting continued almost uninterruptedly ever since the operation was finished; headache very severe; quarter grain morphine hypodermically for pain in head; one ounce of urine drawn by catheter.

7.30 P. M. Nausea and retching, but no vomiting; still has severe pain in the head; thin, yellowish-brown movement from the bowels, watery, but a few ounces; odor very offensive, having the smell of bromide of ethyl.

8 P. M. Another movement from the bowels, the same character as the first.

9 P. M. Another movement of the same brownish water; each attended with some tenesmus.

9.30 P. M. Milk and brandy to be repeated at intervals.

10.15 P. M. Two ounces of urine drawn; bowels moved twice in the last hour. This makes five movements of the bowels in three hours. The odor of the bromide of ethyl in the passages was so strong that it attracted the attention of the inmates of the house.

11 P. M. Pulse 117; temperature in the axilla, $99\frac{8}{10}°$; respiration 25. Still complains of pain in the head; small, brownish, watery discharge from the bowels, attended with tenesmus and mucus.

Tuesday, *February* 10*th.*—12.35 A. M. Very restless; complains of pain and desire to go to stool. Gave one-fifth grain of morphine hypodermically. Hiccough occasionally since 10 P. M.

3.15 A. M. Has slept since the administration of the morphine (2h. 40m.); drew off two ounces of urine; hiccough occasionally since ten o'clock; tenesmus and effort at movement of the bowels. Pulse 125; temperature $101\frac{1}{5}°$; sleeping.

5 A. M. Pulse very feeble. Stimulants.

5.30 A. M. Pulse scarcely perceptible.

6 A. M. Small, brownish, watery movement from the bowels, with tenesmus.

6.40 A. M. Recurrence of hiccough; quietly sleeping; perfectly conscious when spoken to.

7 A. M. I saw the patient, and made the following note: pulse imperceptible; no pain, except in head; somewhat restless. I fear internal hemorrhage, because the diarrhœa does not seem to have been sufficient to prostrate her to this extent. Her breath is highly charged with the ethyl odor. The movements from the bowels are brownish dirty water, with some tenesmus and mucus. Passed a catheter into the sigmoid flexure, and injected thirty grains of tannin and twenty drops of laudanum, which passed off immediately.

7.45 A. M. Very restless, wishes to sit up; growing weaker; mind wandering.

8.40 A. M. Catheter introduced; no urine in the bladder; pulse imperceptible. Respiration, 36; temperature $102\frac{1}{10}°$.

10.30 A. M. Catheter introduced, teaspoonful of high-colored urine drawn.

11 A. M. Severe convulsion, with frantic ravings. Convulsions ceased at 11.40 A. M., with heart-rending screams, and she died at 12.15 P. M., about twenty-one hours after operation.

Wednesday, *Feb.* 11*th*, 8.45 A. M.—Post-mortem made (twenty

hours after death) by Dr. S. Waterman, Dr. Waterman, Jr., and Dr. Nash. External wound, three inches and a half long. Sutures (eight) removed, edges of wound adherent throughout. Abdomen laid open by free incisions, longitudinal and transverse. Two and a half ounces of bloody serum in the peritoneal cavity, three drachms of it having been in the Douglas pouch, below the retroverted uterus. There was no exudation of lymph, and no sign of peritonitis.

The left broad ligament united to sigmoid flexure by old and strong adhesions, which were broken up, and then the uterus and broad ligaments were removed, together with utero-sacral ligaments, a portion of bladder, and the upper part of vagina. The lower part of the ileum, for about eighteen inches, looked dark and congested, and about twelve inches of it were removed, severing it at the caput coli. The colon was also of the same dark-brown color, and five or six inches of the descending colon were removed, and also both kidneys. The kidneys seemed to be healthy.

Now the question arises, What were the causes of death in this case? Before the post-mortem was made, I supposed that the uncontrollable efforts to vomit had resulted in displacing some of the pedicle ligatures, and that my patient had died from slow internal hemorrhage. But the post-mortem proved otherwise.

In a letter received from Dr. Levis (Feb. 19), he says: 'It seems to me that the only unpleasant symptoms which could possibly be referred to the anæsthetic were those of the head; and it is evident that the death of the patient is not to be atributed to cerebral causes. As to diarrhœa or cholerine, which, probably with shock, seemed to cause death, that could not be attributed to the anæsthetic. Ethyl has been used in this city about two hundred times, uniformly with the most happy results. In my experience, there has been no headache, or other evidence of cerebral disturbance, following the administration. No bowel affections have been observed, and none would be thought of. Do not be too hasty in the association of the anæsthetic with the cause of the death. Many patients have died within twenty-two hours after the administration of ether and chloroform.'

Some persons think that death was produced by cholerine. Let us sum up these evidences bearing on this point.

The patient took three drachms and fourteen grains of Rochelle salts at 8.30 A. M. It operated freely, twice, before 11 o'clock, about two hours after the operation. She then had six thin, brownish, watery discharges from the bowels, between 7 and 11 o'clock P. M., not large, but attended with tenesmus, and the last with a little mucus. At 12.15, 2.40, and at 6 and 7 next morning, there were other thin, watery, brown discharges, with tenesmus, and a little mucus, and the patient wanted the bed-pan under the pelvis constantly.

Thus we see that, between 7 P. M. and 7 the next morning, there were not less than ten watery, not profuse, but exhausting evacuations, over which opiates and astringents did not exercise the least influence. Dr. Nash says: 'A few hours before death there were several (two or three), large involuntary movements from the bowels—such as she had previously had—dirty, thin water, with the disagreeable ethyl odor.' The lower portion of the ileum and the colon were black and congested, and altogether presented an appearance far from a normal, healthy one.

This is a strong array of facts to sustain the cause of death by cholerine; and, in all probability, this cholerine had a bearing on the termination of the case. But from my standpoint of view, this was only secondary. Was death, then, caused by the anæsthetic?

Let us here sum up the evidence bearing on this point.

The patient was under the influence of the anæsthetic for an hour and a half. Its effects were different on her from what has been observed by Dr. Levis and others, of Philadelphia. She breathed often sixty times a minute. She had opisthotonic convulsions three times during its administration. When she recovered from its effects, she complained all the time of severe pain in the head. She had a congested state of the eyes and eyelids; and she had convulsions before death; and the discharges from the bowels smelt so much of the ethyl, that the inmates, all over the house, noticed and complained of its peculiar, disagreeable odor. The woman who washed and dressed the body after death, says that the odor of ethyl from the lungs, when she would roll the body over, was as strong as when it was being administered. When we came to make the post-mortem, we found the ethyl odor pervading the intestinal canal, and other organs of the body. At 8.45 A. M. the post-mortem was made, and I wrapped up the portions of intestine removed,

the uterus and its appendages, and the kidneys, in a sheet of newspaper, and took them home, and placed them (as I was hurried) on a table, in the distal end of my consulting room, where they lay till 9 P.M., about eleven hours. During the afternoon and evening, the ethyl odor emanating from these pathological specimens was particularly noticeable in the part of the room in which they were laid.

At 9 P.M. they were unrolled in the presence of Dr. Nash and Dr. Gilliam, to be placed in spirits for preservation. When the specimens were examined separately, we found the intestine, which had been split open, smelling strongly, not from feces, nor of dead animal matter, but of the anæsthetic; and when the kidneys, which had been laid open, were brought near the nose, it was almost like smelling ethyl from an empty bottle. From this, it would seem that every fibre, every tissue of the body, in its minutest parts, was saturated with the ethyl.

We know that anæsthetics, whether ether or chloroform, must be eliminated from the body, and that the lungs and the kidneys are the usual emunctories selected by nature for this purpose. But in this case, the kidneys were locked up, as it were, and hence the bowels were called on to aid the lungs in getting rid of the poison. It is altogether probable that the cholerine was due wholly to the action of the ethyl, and not to the salt, which, as is usual with such a dose, exhausted itself by 11 o'clock in the morning, four and a half hours before the anæsthetic was given, and eight hours before the thin, watery, brownish discharges began. It is hardly probable—I should say possible—for three drachms of Rochelle salt to produce such a condition of the mucous membrane of the ileum and colon as we found here.

I sent the pathological specimens to the histologist for examination on the 12th of February, and I received a verbal report a fortnight afterward, saying that the kidneys were healthy. But a few days ago I received the following:—

'The kidneys, to the naked eye, looked normal. Under the microscope, there was a slight increase of the interstitial connective tissue. Many of the convoluted tubules showed swollen and coarsely granulated epithelia, and considerable narrowed central calibre, a characteristic feature of acute catarrhal nephritis.

Slight cirrhosis of the kidney, with acute catarrhal nephritis,

often exists, without marked clinical phenomena, and may be overlooked by the physician.'

Now, if this account of the kidneys (which I do not understand) amounts to anything, let us look at the case from this point of view.

Dr. Nash, in his report to me, says: 'From the time she was laid in bed, she was excessively nauseated, and had great restlessness and intense straining efforts to vomit; her eyes were red, both conjunctivæ and lids, and when asked what pained her, replied, 'Oh! my head! my head!' When spoken to, she would answer intelligently, but at no time addressed any question or conversation to any one.

After answering questions, she would relapse into a state of restlessness and groaning, often throwing her hands up to her head. In order to quiet her, sulphate of morphia was given hypodermically, which never completely controlled her. It was difficult for two nurses to keep her covered, on account of constant motion of arms and legs, and rapid turning from side to side for two hours after the operation. I frequently asked her if she had pain at the seat of operation, and she invariably replied, 'No! my head!' The expression of face was never natural after operation, jaws much sunken, and eyes often rolled upward. The discharges from the bowels were saturated with the odor of the ethyl, and the lady of the house and others told me that the medicine we gave to put her to sleep had gone through her bowels, as they smelt it when the bed-pan was emptied into the closet. Not until about ten hours after the operation, did she acknowledge having pain in the abdomen, and that was merely the tenesmus attending the cholerine evacuations.

I never considered her as having entirely recovered from the effects of the anæsthetic. The convulsions consisted in frantic ravings, with agonizing screams; eyes wide open, glaring, and intensely red. Then followed a few moments of quiet, and then death.

A few hours before death there were several (two or three) large involuntary movements from the bowels, such as she had previously had—dirty brown, thin water, with the disagreeable ethyl odor.'

In reading Dr. Nash's report carefully, we are led to ask: 'Was this a case of uræmic death?' We know very well that

ether, as an anæsthetic, often proves fatal, where there is an organic disease of the kidneys. Dr. Emmet was, I believe, the first to impress this on the medical mind.

I have seen two deaths from etherization in women over fifty years of age, where no disease of the kidney was suspected, till fatal coma was produced by the ether. In these cases, the secretion of urine was almost instantly arrested, and the little found in the bladder was loaded with albumen. One of these was a patient of Dr. James R. Woods; the other, a lady from Brooklyn.

In cases of organic kidney disease, the hydrobromic ether may be just as dangerous as ordinary ether. In the case under consideration, between the time of operation and death twenty-one hours after, there were drawn off but five ounces and one drachm of urine, viz.: one ounce at 6.15 P.M., and two ounces at 10.15 P.M.; on the 9th, two ounces at 2.40 A.M.; on the 10th, bladder empty at 8.40 A.M.; one drachm at 10.30 A.M.; death at 12.15 P.M.

Of course, the purity of the article is essential to its successful action, just as the purity of chloroform and ether is essential to theirs. Was the ethyl given to my patient pure or impure? You will perceive what a difference there is in odor between the two. The Wyeth sample is not unpleasant to the smell; the other is execrable. It is very important to determine this point before we condemn this new anæsthetic. It has many qualities to recommend it; it is easy to administer; the patient goes quickly under its influence, and recovers rapidly from its effects. But, if it is dangerous, all these qualities pass for naught. Would it be asking too much of the academy to order an analysis of these two specimens of hydrobromic ether to be made for the benefit of the profession at large? If the two are identical in their chemical characters, then I should not advise the use of hydrobromic ether as an anæsthetic. But if it be proven that one specimen contains noxious properties, not in the other, then I would advise further experiments with the pure article.

We know that ether is safe in long operations, and that chloroform may be unsafe in short ones. It may be possible that hydrobromic ether will prove safe in short operations, and unsafe in long ones.

In some of Dr. Laurence Turnbull's cases it produced very

distressing effects, which, if prolonged, might have ended, as my case did, fatally.

Dr. Turnbull gave the hydrobromic ether to a nervous, hysterical woman, aged twenty-five (Case 8), for the purpose of replacing a retroverted uterus, and adjusting a pessary to relieve the above symptoms. During the administration the pulse was but slightly accelerated; return of consciousness was accompanied by excessive gagging and vomiting of large quantities of mucus, great burning in stomach and throat, severe headache, cold perspiration, weak and rapid pulse, all of which continued for twenty-four hours, with more or less severity. Both sulphuric ether and chloroform had previously, on several occasions, produced similar symptoms, but not so severely.

Any agent which in four minutes' time could produce 'excessive vomiting, burning in stomach and throat, severe headache, cold perspiration, and a weak and rapid pulse,' which continued for twenty-four hours—would, if the anæsthetic had been continued (as in my case) long enough for the whole mass of the blood to become poisoned, and for every tissue in the body to become saturated with it—would, I say, certainly have ended in the death of the patient.

Dr. Levis has had a larger experience with this agent than any other surgeon, but his longest operation was but forty minutes, whereas my unfortunate case lasted an hour and a half. It may be that we did not administer the ether as skilfully as it should have been done. But I do not think we could have given less, and maintained the anæsthesia sufficient for its purpose.

If the operation had been comparatively short; if it had lasted only twenty or thirty minutes; if it had terminated before my patient's system—solids as well as fluids—became perfectly saturated with it, she would, in all probability, have recovered; but, as it was otherwise, I must raise a warning voice, especially in prolonged operations.

It would be an interesting scientific inquiry to determine if ethyl poisoning, by inhalation, produced cholerine with a deeply congested condition of the mucous membrane of the lower portion of the alimentary canal, and also to determine what other pathological changes it might induce.

This could easily be done by experiment on the lower animals, and it is to be hoped that some of our physiological savans will

soon tell us, by such experiments, what we have to hope and fear from the long continuance of the bromide of ethyl as an anæsthetic.

The inference that I draw from the facts in the history of this case is, that the anæsthetic was the cause of death, while the manner of death may have been by uræmic poisoning. The lesson from this is, never to give bromide of ethyl in prolonged operations, and never to give it where there is organic disease of the kidneys. What, then, shall we give?

This paper being before the academy, the discussion, on invitation by the president, was opened by Dr. Levis, of Philadelphia, who gave an explanation in reference to the difference in results obtained by Dr. Sims and himself. He thought there might be a difference in the method in which it was used, and that some of the errors were such as he made in the first cases in which he administered it, when he began very cautiously. He now knew that the proper method of administration was to make a rapid impression, such as was done in giving nitrous oxide gas. He had been able, nearly always, to produce complete anæsthesia by the use of two drachms, in two or three minutes. He had produced anæsthesia in forty-five seconds; but if the patient could be made to inspire and expire freely, the average time was about three minutes. The only point in Dr. Sims's case which impressed him especially, was the duration of the operation, and the large quantity of the anæsthetic used. In his own cases, the operation had not lasted longer than forty minutes, and the entire quantity of the ethyl used was eleven drachms. He had not seen any after-effects whatever. As to nausea and vomiting, it perhaps was almost as likely to occur after the use of the ethyl as after the use of ether, if a considerable quantity was given. The quality of the article he regarded as very important, and he was sure that, since he had used Wyeth's preparation, there had been less tendency to nausea. With reference to the persistent odor in the breath, vomited matters, etc., he had noticed it when he had used the same preparation that Dr. Sims used.

The President.—It will be noticed that the symptoms and phenomena manifested differ entirely from the symptoms and phenomena manifested after the administration of any other anæsthetic which has been used. I therefore take the privilege of calling upon Dr. Squibb, of Brooklyn, with a view of ob-

taining an explanation of its failure to be eliminated from the system; that is, whether there are any constituents, either bad or good, in the ethyl, which of itself might destroy life.

Dr. E. R. Squibb.—I fear, Mr. President, I have but little to add to the elucidation of this subject, and I must premise my remarks by saying that all I have to say upon the question is entirely theoretical. I confess to having had a prejudice against this agent from the earliest I knew anything of it, and it is upon theoretical principles, and upon those only, that I am capable of speaking or throwing out hints which possibly may be useful. As a chemical rule, I think that the anæsthetics which are the least dangerous, are those which are the most simple, and, when decomposed, yield elements which, physiologically, are known to be the most innocuous. If we commence with the nitrous oxide, we find it is decomposable only into innocuous elements. If we go one step further, and take the oxide of ethyl (and here I wish to protest against the bromide of ethyl being called an ethyl), it can be decomposed into comparatively innocuous elements. In the bromide of ethyl the oxygen of the ordinary ether is replaced by bromine, and the compound contains 73 per cent. of bromine; the other 27 per cent. being the ethyl. Now, when we compare the effects of all the known anæsthetics, we will find that those are more easily borne which are simplest in their nature; that is to say, the compound ethers are less safe than the simple ethers, and both the compound and the simple ethers seem to be proportionately safe to the simplicity and innocuousness of the elements of which they are composed.

We all know that bromine is an irritant poison. We all know that bromide of ethyl is a loosely molecular article, is decomposed very easily, much more so than bromides of ordinary bases, which act as salts, and are eliminated as such. Now, we will suppose that bromide of ethyl, under certain circumstances, is decomposed, and its irritant property, the 73 per. cent. of bromine, goes into the system; it is easy to understand that grave effects might be produced, and perhaps we shall be able in this way to account for the exceptional cases in which the anæsthetic had been used with unpleasant results, whereas, if it had remained as bromide of ethyl, it may not have been harmful.

Let us take an analogy found in chloroform, which contains

89 per cent. of chlorine. Chlorine is one of the organic bodies which do not possess the irritant properties that bromine does, and two atoms of chlorine are not so active in producing toxic effects as one atom of bromine found in the bromide of ethyl. The point can be illustrated still further, by supposing the existence of an arsenite of ethyl, the activity of which, in producing dangerous effects, as compared with bromide of ethyl, would be represented by the difference between the activity of bromine and the activity of arsenic as irritant poisons. If it is admitted that such theoretical arguments have any value, I think we could understand some of the dangerous effects produced, when compound ethers are used as an anæsthetic; and I think Richardson's observations point us toward the conclusion that compound ethers are less safe than simple ethers, and that simple ethers are less safe still than the oxides. This brings us down to the oxides and nitrogenous oxides of ethyl, which are the safest of all known anæsthetics.

There is another point, and that is, any agent that can be powerful and active for good, can be powerful and active for evil. We see that in chloroform, and we see it in the bromide of ethyl. I think we can logically argue something from the chemical composition of agents, as to which will be useful to us, and especially in the application of agents which carry us so near the dividing line between life and death.

Dr. J. C. Dalton.—I should be very happy, Mr. President, to give to the Academy, in response to your invitation, any information, did I have it, with regard to this subject. But unfortunately, I am worse off than Dr. Squibb, for I had never even seen hydrobromic ether before this evening. There were some points in Dr. Sims's paper, however, which struck me very forcibly, and one is the different kinds of danger which may be developed by different kinds of anæsthetics. I suppose that the profession is tolerably well convinced now that ether, when it is dangerous as an anæsthetic, is mainly so in consequence of the presence of some morbid change in some vital organ; that, when the entire body is perfectly healthy, ether comes as near to being a perfectly safe anæsthetic as we can have. I do not know of any modification with regard to that statement.

In this case reported by Dr. Sims, if the death was due to the hydrobromic ether, it was a death which took place long after the substance was administered. It was a death apparently due

to the persistent obstinate possession which the bromide of ethyl had taken of the entire system. The system could not get rid of the substance with which it was saturated, and which in some unexplained way produced those symptoms which have been so faithfully detailed. I do not wish to proffer any opinion regarding the cause of death in the case, but it seems that there was a repetition of peculiar symptoms, in the midst of which the patient finally died, and that, after death, the entire system did retain, during a long period, the bromide of ethyl in sufficient quantity to indicate its active properties. How entirely different deaths from chloroform take place! They occur without any convulsions, without any marked symptoms, and odoriferous bodies of persons who have died under its influence have not been specially observed. I do not suppose, however, we have yet exhausted all the methods by which various anæsthetics are dangerous, or may prove fatal. But the difference between the manner in which death is produced by chloroform and by ether when given to animals has, in my experience, been very striking; so much so, that I long ago abandoned the habitual use of chloroform while experimenting, because it was so annoying to lose an animal just before the experiment was required, and could not be postponed. Not long since, in order to avoid the disturbance produced by ether, I chloroformed a cat for the purpose of making an ophthalmoscopic examination. With all the recollection of frequent previous disappointment fresh in mind, I was extraordinarily careful in giving the anæsthetic, both with reference to quantity and time occupied in its administration, and all the circumstances that could affect the result, and yet, just as I wished to use the instrument, the animal was dead. Here, however, we seem to have another mode of death, and one which, if real, is perhaps as difficult to avoid as sudden death in the use of chloroform. I am unable to see how any greater care could have been used than was exercised by Dr. Sims, although it is possible that Dr. Levis, who has a much greater experience in the use of the agent, might point out some improvement in the method adopted.

Dr. A. C. Post remarked, with reference to the prolonged action of anæsthetic agents, that he had been in the habit, for several years, in cases in which he anticipated a long operation, to use Prof. Nussbaum's method, premising the use of the anæsthetic by

the hypodermic injection of seven or eight minims of Magendie's solution of morphia. He had found by so doing that the anæsthetic effect could be kept up for a long time with more quietude and less quantity of the anæsthetic than where the morphia had not been thus administered, and he was inclined to think it added to the safety of the patient, as well as to the comfort of the surgeon.

Dr. JAS. L. LITTLE referred to two cases, as follows: CASE I.—Last Tuesday, having received a specimen of the bromide of ethyl from Wyeth, of Philadelphia, he determined to test its anæsthetic properties, and accordingly gave it to a boy three or four years old, upon whom he proposed to perform Heaton's operation for the radical cure of hernia. The ethyl was administered in the manner proposed by Dr. Levis; probably less than *two* drachms were used, and the patient went under its influence in less than two minutes. The pupils were contracted. Within five minutes after the cloth was removed from his face, the child was able to respond intelligently. There was no vomiting.

CASE II.—An adult, in good general condition, had two or three drachms held close over his mouth and nose on a napkin, and at the end of three minutes no special effect had been produced by the anæsthetic, except to excite powerful struggling on the part of the patient. The ethyl was applied more freely, the patient struggled very violently, the face was suffused, not however like that seen in ether inhalation; the pupils dilated and contracted alternately, the eyeballs rolled about; and at the end of *eight* minutes Dr. Little became somewhat alarmed at the condition of the man, and discontinued the ethyl. The patient seemed, within three or four minutes, to come from under what influence of the anæsthetic he had received. The quantity used was *two ounces* and *two drachms* by weight, and the time occupied *eight* minutes. There was neither nausea nor vomiting. Both the pulse and the respiration became exceedingly rapid. The condition was entirely different from anything he had ever seen in connection with the inhalation of either chloroform or ether. Ether was subsequently administered, and the operation performed.

The PRESIDENT.—It will be noticed that Dr. Sims reported in his case that the respiration became exceedingly rapid. In the administration of this anæsthetic it seems, from what has been said, that it is necessary to produce its anæsthetic effect as rap-

idly as possible; that no atmospheric air is admitted, or just as little as possible. Of course, associated with this is another influence. We know that the exhalation of carbonic acid gas is limited, and, therefore, the question naturally arises: May not that fact be one which contributes to the danger; may not a part of the poisoning be due to the carbonic acid gas? I will next call upon Dr. Wylie, who has had experience with Dr. Sims in the administration of this agent.

Dr. Wylie remarked that he had nothing to add to the details of the case which Dr. Sims had reported, except that he endeavored to follow Dr. Levis's directions regarding the mode of administration in the most exact manner. In three cases in which he had administered it, he had seen the muscles in general convulsed. He was satisfied that hydrobromic ether could not be used as an anæsthetic with the same freedom as could ether.

He had not had any difficulty in administering either chloroform or ether, having used both many hundreds of times, yet it was just possible that he failed to give a sufficiently large quantity of the ethyl just at the beginning. He could see no other explanation for his failures in attempting to produce safe anæsthesia with the new agent.

Dr. Squibb made special reference to two points: 1. In the many substances employed, the anæsthesia is separate from other effects produced by the agent. Therefore, it is necessary to be cautious in regarding the disappearance of the anæsthesia as the disappearance of the entire effects of the agent; that is to say, the disappearance of the anæsthesia suddenly after the administration of the agent has ceased, does not indicate that the effect produced by the anæsthetic has passed away. 2. Many of the symptoms in Dr. Sims's case looked very much like those belonging to bromine poisoning. If it was a case of poisoning by bromine, that fact was to be separated from the known character of the agent as an anæsthetic. A better illustration of the effects of an irritant poison, he thought, could hardly be found, not only upon the alimentary canal, but also upon the kidneys. The idea that the organic condition of the kidneys, discovered only by the microscope—and that after they had once been thought to have been healthy—was a condition that had anything to do with producing the death of the patient, did not look probable in view of the presence of other well-marked irritant symptoms. He would say, therefore, that he should abstract the anæsthetic

element altogether from the case, and study it as a simple case of irritant poisoning. The color of the eyes, and their peculiar movements, and the intense pain in the head, together with the other symptoms, pointed directly to the irritant effect of some such agent.

Dr. ROBERTS, of Philadelphia, on invitation, remarked that he had administered the bromide of ethyl many times as an anæsthetic, both for Dr. Levis and in his own practice, yet he had nothing special to add to what had already been said. He had had no experience whatever in the use of chloroform, and therefore was unable to compare the bromide of ethyl with that agent. His own experience with ether had been that it was a safe anæsthetic, sometimes, however, requiring large quantities to produce the desired effect. The most troublesome symptom he had observed with ether was the expectoration of large quantities of mucus and the existence of coarse bronchial râles, due to hypersecretion into the bronchial tubes. He always felt specially disturbed with reference to the respiration of a patient inhaling ether. One of the chief benefits arising from substituting the bromide of ethyl for ether was, that the ethyl affected the respiration but little, except to a certain extent, to increase its frequency. In no case had he seen hypersecretion of mucus, such as was so annoying in etherization, when bromide of ethyl was used. As a rule, the pupils had been dilated during the period of the most profound anæsthesia. It was a little difficult to judge of the pulse. The eyes were not so suffused as in etherization. As a rule, patients had come from under its influence promptly. In two cases he had observed nausea. He was not at all an advocate for the agent, but simply felt interested in assisting to place it upon record as an anæsthetic that had been used successfully. He thought it possible that, in Dr. Sims's case, sufficient stress had not been laid upon the operation itself as a factor in producing the death of the patient, as some deaths had followed the abdominal incision for removal of the ovaries, or Battey's operation. With reference to the tetanic convulsions, he thought they were not infrequently seen in connection with the use of ether. He also called to mind a case in which the patient had severe convulsions occurring with etherization, and it was subsequently found that the patient was an epileptic. It was possible that some such influence might have been at work in Dr. Sims's case. He thought that it might be difficult

to use the ethyl in plastic operations about the face, because its effects were so evanescent."

Remarks on the Bromide of Ethyl, or Hydrobromic Ether.—In criticizing this admirably written paper (read before the New York Academy of Medicine, March 18, 1880), by so distinguished a surgeon and able writer as my friend, Dr. Sims, I feel I am undertaking a very delicate and difficult task, and yet I consider it to be a duty which I cannot lay aside, as part of the responsibility of the reintroduction of the hydrobromic ether as an anæsthetic is due to me.

In several careful readings of the report (published in the *Medical Record*, New York, April 3, 1880), my impressions were as follows:—[1]

First, that after the patient had been relieved, "the uterus replaced, the cervical canal enlarged, with menstruation normal in quantity and painless" (p. 362), no more fault could be found with the ovary or the uterus which received the menstrual fluid; the epileptic seizures were, therefore, not due to the diseased ovary, but were more likely caused by anæmia of the brain, which fact numerous experiments on animals have proven to be the case. There is every reason also, on clinical grounds, to believe that in the epileptic paroxysm the brain is successively anæmic and congested. Again, if these epileptic attacks had been entirely due to the diseased ovary, pressure on it or them would have produced these convulsions, or, on the other hand, would have checked them. There was, so far as we have noticed, no test of this kind instituted.

Second, we have always considered "Battey's operation" one of the most barbarous and unjustifiable in surgery, and it is well known that several deaths have followed the abdominal incision for removal of the ovaries.

Of eleven cases of extirpation of the ovaries, collected by Dr. Goodell (*Transactions State Medical Society*, 1879),[1] in which the operation was performed for fibroid tumor of the womb, of these, one was his own, three proved fatal, a large mortality in this form of disease, which is very manageable and rarely kills the patient. In some of these cases, like that of Hegars, of Freiburg, the tumor grew smaller for five months after the operation, and the menstrual flux was absent; then a hemorrhage took place, and

[1] "Normal Ovariotomy; Extirpation of the Ovaries; the Vulgar term of Spaying," Transactions State Medical Society, Pennsylvania, 1879.

an increase in growth was observed, but unfortunately the patient was soon after lost sight of. In conversation with a distinguished authority in this department, we were told that all the fatal cases of this operation in the city of Philadelphia alone were not reported.

Third, an operation of such magnitude and of so much importance to the life of the patient, should not have been performed upon a confirmed epileptic.

Fourth, before performing this hazardous operation the urine should have been most carefully examined by various tests and by the microscope. It is now a well-recognized condition that in disease of the kidneys anæsthetics almost invariably produce coma and death. In the post-mortem examination of the kidneys of the patient, in the examination by the microscope, "there was a slight increase of the interstitial connective tissue, and many of the convoluted tubules showed swollen and coarsely granular epithelia and considerable narrowed central calibre, a characteristic feature of acute catarrhal nephritis."

Fifth, no laxative or purgative medicine is at all justifiable or even allowable on the day of the operation, or soon after the operation of extirpation of the ovary; and we know of one case in which everything was going on well after an operation for ovariotomy, when an officious neighbor called to see the case, and the patient stated that she had considerable pain in her stomach and bowels, and the friend advised a dose of castor oil, which the nurse gave without consulting the doctor. It operated, and the patient forthwith passed into a state of collapse and died. In three cases of ovariotomy in which I assisted the late Dr. Washington Atlee, he invariably shut the bowels up by means of McMunn's elixir of opium, and never disturbed them for days, and had the patients so strictly watched that no outside interference was possible. Now, Dr. Sims's patient "took three drachms and fourteen grains of Rochelle salts at 8.30 A. M. (on the morning of the operation, the food or stimulants given not stated). It operated freely twice before 11 o'clock A. M., and no more till 7 P. M., about two hours after the operation." She then had six thin, brownish, watery discharges from the bowels between 7 and 11 P. M.—not large, but attended with tenesmus, and the last with a little mucus. At 12.15, 2.40, and at 6 and 7 next morning there were other thin, watery, brown discharges with tenesmus and a little mucus, and the patient wanted the

bed-pan under the pelvis constantly." "Thus we see that between 7 P.M. and 7 the next morning there were no less than ten watery, not profuse, but exhausting evacuations, over which opiates and astringents did not exercise the least influence."

Dr. Nash, one of the physicians who made the post-mortem, says: "A few hours before death there were several (two or three) large, involuntary movements from the bowels, such as she had previously had—dirty, thin water, with the disagreeable ethyl odor. In the post-mortem the lower portion of the ileum and colon were black and congested, and altogether presented an appearance far from a normal healthy one."

In all the operations performed by Dr. Levis, Pancoast, Samuel W. Gross, and myself there has not been one single instance in which there has been the slightest disturbance of the bowels, not even in the case of mine reported by Dr. Sims, or in other protracted operations, such as amputations, resections, etc.

Sixth, it will also be noticed that in the report of the post-mortem mention is made of the injury of the bromine, which was not free, on the mucous membrane of the throat and lungs referred to by Dr. Squibb. There is absolutely nothing stated concerning the appearance of the brain, when so much importance is given to the "pain in the head," and yet up to 7.45 of the morning of her death there was no coma, she being perfectly conscious when spoken to at 6.40. Her convulsions were truly epileptiform in character from the drain upon her system by the loss of blood, and the exhaustive diarrhœa causing the most positive anæmia of the brain, with the superadded inflammation of the colon and ileum, as was proven by the post-mortem.

I place on record two post-mortems of animals killed by almost entire exclusion of air and by crowding the hydrobromic ether upon them, and showing the peculiar appearance of the parts.

The late Dr. Thomas Nunnelly[1] placed "a cat in a six hundred cubic inch jar in which there was one drachm of hydrobromic ether. He absolutely did not move a muscle, but gradually sunk down head foremost to the bottom of the jar, and in one minute he was perfectly insensible. The respiration became laborious, then slower, and in fifteen minutes it altogether ceased. In twenty-five minutes he was removed from the jar, which still smelled very strong of the ether."

[1] Transactions of the Provincial Association, vol. ix., London, 1849.

"*Post-mortem examination immediately.*—Muscles quite flaccid. On dividing the phrenic nerves the diaphragm moved slightly. Chest: lungs crimson in color and much collapsed; pulmonary veins very full; bronchial membranes pale and dry; heart, both auricle and ventricle, on the right side, as full as possible; the venæ cavæ also excessively distended; the left auricle also very much distended, but the left ventricle was firmly contracted and empty; the proper vessels of the heart were not much filled; the blood was alike dark on both sides. Head: sinuses filled, the pia mater congested, as was the brain, but not in a corresponding degree; its substance was serous, and there was little fluid in the ventricles."

The following experiments were made before the class of the Pennsylvania Dental College by me with hydrobromic ether to show that, if no atmospheric air were allowed to enter the lungs with the ether inhaled, both man and animals must die. I then produced profound anæsthesia in a pigeon and a dog. I informed the class that we would so exclude the air from the rabbit that we would kill it, as an evidence that caution must be employed with all agents that would produce such an amount of insensibility. It will be noticed that the post-mortem agrees with that of Mr. Nunnelly. The eye was open, bright, and pupils dilated, no evidence of any redness or congestion about the cornea, and yet the animal had inhaled over an ounce of the ether. There were no convulsions, no great rapidity of pulse or action of the heart, the animal sinking into a lifeless mass. No means were taken to resuscitate it.

Post-mortem.—The right side of the heart was found engorged with dark venous blood; the left side very much contracted and empty. The lungs very slightly congested at their base—not enough to have had any effect in causing death. The kidneys were much congested with venous blood. The brain was entirely free from blood, not even the puncta vasculoso being seen, but at the Torcular Herophili was found a large drop of dark blood.

Much importance is given to the retained odor of the hydrobromic ether; but this is a common occurrence, as in any operations of long duration, when ordinary ether has been employed, the odor is noticed for several days, not only by the patient, but by his friends.

The subject of the injurious influence of the decomposed

hydrobromic ether has been dwelt upon, and the injurious or poisonous effect of the bromine as stated by one of the physicians who took part in the discussion. Now, this bromide of ethyl is termed a loosely molecular article, is decomposed very easily, much more so than bromides of ordinary bases which act as salts and are eliminated as such. Now, we know, from numerous practical experiments, both on animals and man, that hydrobromic ether is eliminated from the skin, kidneys, and lungs not at all decomposed, and has no special irritating effects either on the stomach or intestines of man or animals. When animals are killed by hydrobromic ether, there is no irritation about the eyes, nose, or mouth. In certain cases this ether exerts a beneficial influence on irritation of the intestines; for instance, in the colic which sometimes affects children, and in the pain of nervous dyspepsia and headache. Again, instead of causing convulsions it checks them; it is also useful in delirium and acute mania. The whole amount of hydrobromic ether employed was four ounces, in drachm doses, covering the time of one hour and a half. Part of the ether was, no doubt, left on the cloth or napkin, and part of it was lost in the struggles of the patient. Now, the whole amount of bromine was comparatively small in quantity in the hydrobromic acid, into which the bromine is converted by the reaction of potassium bromide and diluted sulphuric acid, with alcohol, into hydrobromic ether.[1] The amount which the patient received, we are sure did not contain much more of bromine than is contained in the forty to sixty grains of bromide of potassium she was accustomed to take for her epileptic attacks three or four times a day.

Now, what is the true physiological effect of bromides, when taken in large and repeated doses? Acne of various forms, diminished sensibility, followed by complete anæsthesia of the soft palate, uvula, and the upper part of the pharynx, when the patient is fully under the bromine influence.

In summing up all the facts in the case, I feel assured that less than four ounces of hydrobromic ether were not the cause of death.

[1] By the improved method of preparing this agent, the reaction is as follows: potassium bromide and diluted sulphuric acid are heated in a flask, when hydrobromic acid begins to be disengaged, alcohol is allowed to flow in slowly, the distillate is hydrobromic ether, which requires washing with water and alkaline carbonate, and rectification.

A few more points have suggested themselves, on a more thoughful consideration of the case: In spite of the excessive vomiting, post-mortem examination showed that the edges of the wound were adherent throughout.

The convulsions resembled those of epilepsy, as stated by Dr. Nash. This was after the effects of the hydrobromic ether had passed off, and was at 11 A. M. She recovered quietly from the anæsthetic, after being put to bed, at 6.30; the pulse was sixty, full and strong, on Tuesday the 10th.

All anæsthetics are naturally dangerous, from their peculiar qualities, either acting on the lungs, heart, spine, or brain; as well expressed by Dr. Squibb, any agent that can be powerful and active for good can be powerful and active for evil. In all the post-mortem examinations on animals, in not one instance was there the slightest evidence of any symptoms of cholerine, or any congestion of any part of the bowels. Dr. Squibb states that hydrobromic ether can be decomposed into comparatively innocuous elements.

In order to give the profession a full account of this valuable agent, we now give the experiments of Dr. H. C. Wood, published in the *Medical Times* of April 24, 1880. Dr. Wood's article is a study from a toxicological point of view, while Dr. Ott's paper was an experimental study of its use, when properly used for the purposes of an anæsthetic. Dr. Wood's experiments do not prove anything to us; for as yet we have seen no evidence of asphyxia, neither does it cause syncope. He says:—

"My experiments were upon the *bromide of ethyl.* All of the specimens used were manufactured by Wyeth and Brother, of this city.

The important physiological difference between chloroform and ether is in their action upon the heart, and my experiments have been chiefly directed to determining whether the bromide, like chloroform, is depressant to the arterial pressure, and therefore probably dangerous as an anæsthetic, or whether it shares the stimulant powers and the safety of ether. As an anæsthetic I have found it fully as prompt as chloroform, but more evanescent in its influence.

EXPERIMENT I.

Time. M. Sec.	Art. Press. Mm.	Remarks.
0.	50–90	Pressure has been steady for some minutes.
1.		One and a half fluidrachms.
2.	100–120	Dog struggling violently.
2.30	50–180	Dog very quiet, with exceedingly deep and forcible inspirations.
2.40	90–110	Dog quiet.
4.		One and a half fluidrachms.
9.	60–100	Dog profoundly anæsthetized.
10.		One and a half fluidrachms.
11.	40–50	Respirations very much lessened in depth, also slow.

The dog was allowed to recover consciousness, and then one and a half fluidrachms were injected into the jugular vein. The heart stopped at once.

EXPERIMENT II. (a moderate-sized dog).

Time. M. Sec.	Art. Press. Mm.	Remarks.
0.	75–95	Pressure steady for some minutes.
0.30		Two fluidrachms of the bromide.
0.45	80–110	
1.	60–90	Profoundly anæsthetized.
2.	50–60	
3.	30–35	Breathing very much affected. Sponge removed.
3.30	40–45	
4.30	55–60	
6.	75–80	
7.	100–110	Dog perfectly conscious.
11.	90–100	Two fluidrachms of ether.
14.	75–95	Conjunctival reflex almost abolished. Ether was given freely, at short intervals, for the next *ten minutes*, and the dog was kept profoundly anæsthetized.
25.	75–90	Two fluidrachms of ether.
26.30	70–80	Respirations very much suppressed.
27.	80–90	No respiration occurred after this.
27.50	60–70	

EXPERIMENT III.

Time. M. Sec.	Art. Press. Mm.	Remarks.
0.	50–110	Dog breathing very deeply ; pressure has been as marked for some minutes.
0.15		Two fluidrachms of bromide of ethyl.
1.	60–150	Dog struggling very much.
2.	70–100	
2.30	70–100	Profoundly anæsthetized.
3.	50–90	

Time. M. Sec.	Art. Press. Mm.	Remarks.
3.40	60–90	Fluidrachm of the bromide.
4.30	70–90	
5.	65–90	Anæsthesia passing off.
6.	65–90	
8.	75–105	Dog conscious.
10.20		A fluidrachm of chloroform.
12.	65–95	Dog profoundly anæsthetized.
12.50	50–65	
13.	40–50	
14.30	20–30	Respirations slow and feeble.

Extended analysis of these experiments is scarcely necessary. They certainly show that the bromide may cause anæsthesia without reducing the blood-pressure, but also indicate that it is distinctly depressant to the circulation, reducing, when in excess, the force of the blood-current, to a very marked extent."

In our analysis of these experiments we must take into consideration, first, that Dr. Wood had made up his mind that the "bromide of ethyl" was like chloroform a depressant to the arterial system, as he remarks "dangerous as an anæsthetic." He found it as an anæsthetic "fully as prompt as chloroform," and he essayed to discover by his experiments whether it was as fatal; in the latter he was unsuccessful. The dog in his experiment No. 2 was profoundly anæsthetized with the bromide of ethyl, yet it recovered, and it required not a few drops, but one and a half fluidrachms to be injected into its jugular vein before the heart stopped. The dog in experiment No. 3 was also profoundly anæsthetized, the arterial pressure 60–100 mm. Yet in seven minutes the dog was perfectly conscious.

Two fluidrachms of sulphuric ether were then administered, the "conjunctival reflex almost abolished," the ether was then given freely at short intervals for the next ten minutes, and the dog profoundly anæsthetized; two drachms more and "respiration was very much suppressed." Arterial pressure mm. 80–90. No respiration occurred after this; the dog was dead.

In experiment No. 3 another dog was profoundly anæsthetized by the "bromide," yet not killed, nor were there any indications of paralysis of the heart, while the arterial pressure was mm. 70–100. A fluidrachm of chloroform was then administered to the dog, and with this the dog was profoundly anæsthetized. Arterial pressure mm. 65–95. Respiration became at once

"slow and feeble." It is not stated that the dog died, but from numerous experiments of our own, as well as the experience of some of the most distinguished physiologists, it is the exception for the dog to live long enough to perform any experiments upon him. Dr. Wood had to confess that his experiments "show that the bromide of ethyl may cause anæsthesia without reducing the blood pressure;" but, as Dr. Ott pertinently remarks, "the depression is only momentary, and is followed by a subsequent permanent rise to a normal rate."

We now add a second paper of Dr. Ott, an abstract of which he kindly sent me; the experiments are like those of Dr. Wood, *i. e.*, from a toxicological point of view.

EASTON, PA., May 31, 1880.

DEAR DOCTOR: The article on the "Toxicological Action" appears this day in the *Detroit Lancet*. My conclusions are as follows: I write from memory. 1. Bromide of ethyl, either subcutaneously or by inhalation, kills by an arrest of the respiratory apparatus. 2. This arrest is aided by the depressant action of ethyl on the force and frequency of the heart. 3. The arterial tension is at first increased and then reduced, the pulse not falling parallel with the pressure. The fall in blood-pressure is due to a paralytic action on the heart and the main vaso-motor centre; the fall of pulse to a direct action on the heart, probably on its muscular structure. Ethyl in the first stage of anæsthesia produces an increase of tension in the arteries and an increase of pulse-rate. In man 132. Levis has always produced anæsthesia whilst ethyl had increased the pulse and arterial tension. He did not push it till the pulse fell and the tension, and if he had done so, in all human probability we would have seen the accidents recently reported. The question turns as regards safety. Is it necessary to push the ethyl beyond the stage of increase of pulse and tension to produce anæsthesia? If you do so in recent cases (in man) dangerous symptoms may ensue. When five to ten drops of bromide of ethyl are introduced in a diluted state through the jugular vein towards the heart, then the pressure falls as well as the pulsations of the heart.

Very truly yours,

DR. L. TURNBULL. ISAAC OTT.

The Doctor published the following as his conclusions in the *Detroit Lancet*, June, 1880, which give his views more fully than in his letter:—

1. "Bromide of ethyl, by either inhalation or subcutaneous use, kills by a toxic action on the centre of respiration.

2. That the decrease of force and frequency of the heart contribute to the paralysis of the respiratory centres.

3. That injections of ethyl into the jugular toward the heart kill by cardiac arrest, probably due to an action on the cardiac muscle.

4. Bromide of ethyl in toxic doses depresses momentarily the frequency of the heart, followed by a subsequent permanent rise to normal rate.

5. Bromide of ethyl in toxic doses depresses the actual tension steadily, due in major part to the depressant action of the drug upon the heart; and in minor part to a partial loss of tone of either the spinal vaso-motor centres, or the peripheral vaso-motor system.

6. The inhibitory power of the pneumogastric is not paralyzed."

A chemist, Dr. Lawrence Wolff, of Philadelphia, has sent me a reprint from the *American Journal of Pharmacy*, which contains several facts based upon experiments which he made in his laboratory, and we have extracted from his paper the parts which bear upon Dr. Sims's case, and the discussion which followed.

"Although the ethyl bromide thus obtained, as before stated, is by far purer and has less odor than most of the articles found in the market, I have observed that, on evaporating a quantity of it, it left a heavy acrid odor behind which in anæsthesia was bound to prove objectionable if not actually deleterious, and I concluded, therefore, that, after washing, I would re-distil it at a low temperature, which I effected by placing it in a gallon bottle contained in a water bath and connected with a condenser. The bath was heated to a temperature of not over 125° F., at which brisk ebullition ensued and a stream of pure ethyl bromide was received, which is devoid of any and all disagreeable odor, colorless and limpid, of a specific gravity of 1.40, boils at 106° F., and does not burn.

The remains in the bottle were about one-half ounce of a brown acrid liquid, but of which I have not yet recovered a sufficient amount to make a more complete examination. To the taste it is extremely unpleasant, pungent, and representing the disagreeable odor generally found in the ethyl bromide offered in the market.

As regards the stability of pure ethyl bromide, which has been questioned, I have kept samples of my earlier experiments, made almost two months ago, which to-day present the same appearance they had then; and, far from a spontaneous decomposition, I have not succeeded, by either alkalies or acids, or other chemical means, in liberating the bromine from this ethyl or effecting its exchange in double decomposition,[1] and cannot say, therefore, that it deserves the name of a loosely molecular article (Dr. Squibb, *Medical Record*, April 3, 1880, p. 379).

Actuated by a desire to further study the effects of the ethyl bromide, I was led to make a series of experiments on the lower animals and on ourselves, conjointly with my friend, Dr. J. G. Lee, the physician to the coroner of this city. Regarding the safety of it as an anæsthetic, as well as the after effects produced by its use, we made numerous investigations, the results of some of which I will give condensed below.

As an article from the pen of Dr. J. Marion Sims seems to indicate that a most disastrous result has recently occurred from its use (*Medical Record*, April 3, 1880, p. 361), and that being the only and first instance of the kind reported, the ethyl bromide used in that case, as well as the most of it produced heretofore, was presumably obtained in a very imperfect manner, and it seems but reasonable to review the case.

That death occurred twenty-one hours after the use of the anæsthetic seems to imply that it was not its immediate presence which caused this lethal effect. The presence of an odor of ethyl bromide forty-one hours after its administration is hardly in conformity with its volatile character, but seems to point to the presence of a heavier and less diffusible substance contained therein.

Judging from these facts that the deleterious effects might be due to the heavy distillate above mentioned, we gave twenty drops of it to a rabbit, with the result of causing gastro-intestinal irritation, general malaise, and subsequent death in eighteen hours afterwards; while, in the same animal, thirty drops of pure ethyl bromide, given on a previous occasion, produced no worse effects than slight intoxication. A post-mortem examination showed the decided odor of the acrid heavy distillate pervading the intestinal tract and kidneys, while the brain,

[1] I have since observed a reaction with a strong solution of ammonia, yielding ethylamine bromide.

which unfortunately in the autopsy of Dr. Sims's case has not been mentioned, presented a congested appearance, explaining probably the cerebral trouble which Dr. Sims's patient complained of so much. This congestion is totally absent in immediate death produced by the anæsthetic on animals, the brain in such contingencies being generally pale and somewhat anæmic. The abdominal viscera also showed signs of irritation and congestion.

To further satisfy ourselves as to the effects of pure ethyl bromide, we continued our experiments as follows:—

A rabbit of four pounds three ounces weight; anæsthesia induced in one minute by twenty drops of ethyl bromide; pupils first contracted and then dilated; heart acting well, with slight increase in number of beats. By withdrawing and reapplying the anæsthetic as required, the animal was kept under the effects of it for twenty minutes, and on withdrawing it the animal recovered entirely in five minutes.

Another rabbit, weighing three and three-quarters pounds, was made to inhale one drachm of ethyl bromide, producing complete anæsthesia in one minute, causing first contraction, followed by dilatation of the pupil; heart beating normally; voluntary muscles relaxed. The anæsthesia being pushed on by the use of another drachm of the ethyl, the beating of the heart was accelerated, number of respirations increased, and in six minutes heart ceased to beat, after losing perceptibly in impulse. Attempts at resuscitation proved fruitless, but electromotoric sensibility was well preserved. Post-mortem examination showed the brain in a state of anæmia, lungs pale and healthy, right ventricle and auricle distended and filled with ante-mortem clots; no odor of the ethyl perceptible after death.

The above experiments demonstrate that with the cautious use of ethyl bromide, rabbits, which are with difficulty maintained in anæsthesia, can be successfully ethylized without much danger to their lives.

Satisfied as to this, we were determined to obtain information as to its action when administered internally, and for that purpose gave to three of the animals respectively ten, twenty, and thirty minims of the ethyl. While producing in the larger doses more markedly a slight intoxication, no other serious symptoms arose. Encouraged by this, we commenced taking it ourselves, well diluted, first in doses of five and ten, and then

twenty-five and thirty drops, without discovering any noticeable effect, save that of slight sleepiness induced by the larger doses. A nervous headache, existing during these experiments, seems by the ethyl to have been entirely relieved, which, however, might have been the case had any other bromide been taken instead. That it may prove of decided benefit in nervous irritation and hysteria is readily to be inferred herefrom.

To the taste it is sweet and pleasant, but heating to the mucous surfaces, and it should be well diluted before it is administered.

The next case for experiment was that of a rabbit, which we injected hypodermically with five minims of the ethyl, producing, however, no marked effect, save a very slight intoxication. Subsequent injection of another with ten, fifteen to another, and thirty to still another, had again the effect of producing intoxication, with a decided somnolence and relaxation of the muscles, all of the animals recovering, however, completely within one hour. As a comparative experiment, another rabbit was injected with fifteen minims of chloroform, which produced most marked and threatening effects and complete somnolence, from which the animal could not be roused, and only recovered after three hours, remaining for hours afterwards in a stupefied condition.

It is to be remarked here, that in all cases where the animals were injected with ethyl bromide the number of respirations were largely increased.

Determined to ascertain the manner in which the ethyl bromide should prove fatal if injected hypodermically, we injected into one of them, a healthy female rabbit of five pounds' weight, within half an hour, in broken quantities, two and three-quarters drachms of the article, failing, however, to inflict death, or more serious symptoms within the next three hours than those above noted; found, however, that the animal had expired during the following night.

A post-mortem examination revealed a congested brain, but showed nothing beyond that to account for its death.

The inference from these experiments may be set down that, internally as well as hypodermically, the ethyl bromide has no toxic effect on the animal organism beyond that of ether or alcohol.

The absence of any odor of it in intestines, kidneys, and liver admits the theory that it is totally eliminated through the

lungs; that by its presence in large quantities in the system, and if not readily eliminated through the lungs, it acts as a decided stimulant, and may, when used in excess, like ether and alcohol, cause death by cerebral congestion.

Finally, and with a view to test its adaptability and safety as an anæsthetic in comparison with ether and chloroform, we experimented on three healthy rabbits of about the same weight; simultaneously administering by inhalation to one ether, ethyl bromide to another, and chloroform to the third, sufficient being used to maintain profound anæsthesia.

The first one, under ether, was completely under its effect in one minute; heart's action rapidly increased in number of beats, diminished in impulse, death occurring in three minutes.

The second one was in complete anæsthesia from ethyl bromide in thirty seconds; pupils first contracted, then dilated; muscles relaxed; accelerated action of heart, gradually failing impulse; death in seven minutes.

Third rabbit received chloroform, producing rapidly anæsthesia in fifty seconds; heart feeble; at the expiration of one minute and fifty seconds, heart suddenly ceased to beat.

Post-mortem appearance showed the animal killed by ether presenting congested membranes and investments of brain, heart apparently arrested in diastole, clot in right auricle and ventricle, which were largely distended; odor of ether thought to be faintly perceptible on opening abdominal cavity; post-mortem hypostasis well marked in lungs.

Rabbit which died of ethyl bromide presented on post-mortem examination a brain somewhat paler than normal, clots in both ventricles and auricles of heart; death apparently from over-stimulation of this organ; lungs normal; no odor of the ethyl perceptible in viscera.

Chloroformed animal showed on post-mortem examination an anæmic brain, small clots in right auricle and ventricle, heart apparently arrested in incomplete systole, due to clot; lungs markedly congested; no odor of chloroform noticeable."

The inferences from these cases seem to impress us as follows:—

The first and second rabbits, which had been treated with respectively ether and ethyl bromide, died under similar circumstances. The modes of death appear to have been occasioned by a gradual paralysis of the cardiac inhibitory motor centres,

while the sudden heart failure in the third, which is typical of chloroform accidents, seems to indicate paralysis of the cardiac motor centres.

While it is hardly justifiable to infer from experiments on animals, as to the effect on the human organism, it is not to be denied that they go far, along with the many trials on human beings, and those upon ourselves, to show that a direct toxic influence from pure ethyl bromide on the organism need not be apprehended.

That pure ethyl bromide is *per se* an absolutely safe anæsthetic, can as yet not be positively stated, but that its action appears to be quite as safe as ether, and certainly more so than the treacherous and dangerous chloroform, seems to us, as deduction from above-related experiments, out of question.

We can certainly hail this new-comer as another agent destined to alleviate sufferings, which, by its own merits, will win its way into the rank of those we now hold as recognized measures for combating disease, and, as such, propose that by this body it be recommended for a position in the National Pharmacopœia, about to be revised.

The subject of the impurities that may be found in certain specimens of hydrobromic ether are worthy of, and have received, careful study by Dr. Juncks, a competent chemist, and we avail ourselves of all the information on this subject.[1]

"Bromide of ethyl, largely employed of late as an anæsthetic, was first prepared by Serullas by the reaction of phosphorus on alcohol and bromine, in an atmosphere of carbonic acid. The product obtained in this way is usually easy to purify, by simply agitating with a weak alkaline solution. When, however, the bromide is prepared by the reaction of bromhydric acid, ethylic oxide in status nascente, the resulting preparation contains much impurity, which it is very difficult to remove. Though it is possible to remove the greater part of the impure foreign matter present by washing with an alkaline solution, quantities of mercaptanes and ethylene bromide, varying in amount according to the greater or less care exercised in the process, are always present, whose removal is a matter of imperative necessity, but at the same time difficult of accomplishment.

It is the ethylic mercaptane which imparts to the preparation

[1] Therapeutic Gazette, Detroit, Michigan, May, 1880.

the penetrating, sulphurous, and garlicky odor. This impurity seems to oppose very tenaciously the action of oxidizing agents, being first converted into ethylsulphan before its destruction.

The impurity just mentioned is, however, easier to remove than ethylene bromide, as it is not possible to mistake the odor, inseparable from the organic sulphur compound, while ethylene bromide, being colorless, quite aromatic, and also insoluble in water, presents greater difficulties in its detection and separation.

In preparing bromide of ethyl, the greatest share of attention should be given to the just-named ethylene dibromide ($C_2H_4B_2$), as this is a body easily decomposable with evolution of bromine, interfering seriously with the anæsthetic action of bromide of ethyl, and it may even produce fatal results by its presence.

The high specific gravity of this ethylene compound, 2.16, as well as its high boiling point, 129° C. (264° F.), enables us to confirm its presence, if existing in any notable quantity, and no bromide of ethyl should be used having a specific gravity higher than 1.419 at 16° C., and a higher boiling point than 41° C. (105.8° F.). If the proportion of ethylene bromide is considerable, it will even happen, on mixing some of the suspected sample with sulphuric acid, that a part thereof will sink below the surface of the acid.

It is of the greatest importance to caution against the employment of a mixture of bromide of ethyl and chloroform, or against bromide of ethyl, adulterated with the latter, for the reason that in such a mixture, when inhaled, the bromide is readily decomposed, and may produce dangerous results.

A mixture of one volume of chloroform with two volumes bromide of ethyl has a specific gravity of 1.4448, and, on heating in a retort with a little platinum black, gives at once a distillate, partly soluble in water, and of a decided acid reaction, consisting chiefly of chromic and bromhydric acids. What is here accomplished by the platinum black is also brought about in the economy by the analogous operation of the lungs, only on a larger scale; pure bromide of ethyl alone is not decomposed under like conditions. In order to possess the certainty that a pure bromide of ethyl, fit for administration as an anæsthetic, and harmless as such, is under examination, it should first of all answer exactly the simple tests mentioned above, in regard to specific gravity and boiling point; too much value cannot be attached to this initial proceeding. The specific gravity should

never be less than 1.418, and not over 1.419; a preparation of assured purity remaining within these limits. The boiling point should never be over 41° C.

A small quantity of the sample should evaporate rapidly from blotting paper, and should leave no odor, reminding of sulphur or garlic.

Further reactions of a pure bromide ot ethyl are the following:—

1. Agitated with a fragment of metallic sodium, it should remain clear.

2. Mixed with an equal volume of an alcoholic solution of potassa, it should not become turbid for thirty to sixty minutes, even after boiling. An immediate turbidity ensuing can be caused by either chloroform or ethylene bromide.

3. Treated with ammoniacal nitrate of silver, it should not reduce the silver, nor even produce a brown or black discoloration of the solution, which would be the case, were the chloroform present.

4. Heated with Fehling's solution, no reduction of the copper must take place, as would happen with chloroform.

5. When distilled with concentrated sulphuric acid and the distillate afterwards shaken with water, no substances should be imparted to the latter capable of reducing the ammoniacal nitrate of silver or Fehling's solution.

6. If heated with zinc-dust and water, no evolution of olefiant gas should take place, which would indicate the presence of ethyl bromide.

A preparation which will satisfactorily answer to all these tests can be used without hesitation, and in fact with much less danger than chloroform. When inhaled with admixture of sufficient air, it produces relief, for instance in toothache, in a surprisingly short time, without the least indication of any unpleasant after effects. All the above-mentioned reactions are sufficient to show that pure bromide of ethyl is a preparation of greater stability and more difficult of decomposition than chloroform.

When free from ethylene bromide it can be exposed for a long time to direct sunlight without any decomposition taking place.

During the distillation of bromide of ethyl in a closed room, the vapors do not become irritating or annoying to the operator, even when their presence is considerable in quantity, the only

noticeable effect being drowsiness. No unpleasant effects follow this condition, such as headache, dizziness, or irritation of throat and lungs."

Deductions derived from a few experiments on animals to test the effect of this ether on living organisms, though of great value, must be received with a certain amount of caution—justified by the fact that certain deadly poisons for man are nutritive food to some animals. Add to this the unnatural condition in which the animal experimented on is placed (as the entire removal of the heart from the chest walls). Each set of facts has its own proper place and must be kept there, and the clinical observer is to test in his practice the deductions derived from experiments on animals. Much as science has accomplished in establishing the physiological action of many medicines previously used empirically, the practical physician must still, in most cases, be guided by combined experience and be free from egotism, vanity, self-interest, and other passions, which cloud the judgment, while always hoping for and striving after a full knowledge of the relations between the medicine and its physiological or toxicological effects.

In summing up the evidence for and against this anæsthetic, we must always bear in mind that all agents which are of sufficient power to absolutely relieve pain and prevent or produce loss of motion on the part of the patient are, if carried one step further, of such a nature as to produce death, by interfering with or stopping the action of the brain, the heart, or the lungs.

Has this agent ever destroyed the patient in a sudden manner like chloroform, by cerebral anæmia or cardiac syncope—which has occurred in the case of chloroform and all the agents which contain the same elements?

What are the records in its favor? First, it was employed by Dr. Nunneley, of Leeds, for one year in all the operations in the Leeds Eye and Ear Infirmary without a single death. It has also been used since July, 1877, up to April, 1880, three years, with, so far as we are aware, but two deaths, and in these cases the fatal result was not entirely due to the ether.

We regret to record, as having lately happened, the second fatal case. The following is a statement in full of the unfortunate occurrence:—

Case of Death occurring during the Administration of Bromide of Ethyl.[1]

"To obtain a proper appreciation of the merits of any method of operating or of treatment it is necessary to report dispassionately all results: hence, at the request of Dr. R. J. Levis, I hasten to give the history of a patient who died, day before yesterday, during anæsthesia produced by ethyl bromide. The boy was eighteen years old, and was admitted to the Jefferson Medical College Hospital on April 14, 1880, with stone in the bladder, which had given rise, secondarily, to prolapse of the rectum. His health was exceedingly poor, as evinced by feeble pulse and other symptoms of general debility. The operation was accordingly delayed week after week, in the endeavor to obtain a better condition, and he was ordered a combination of iron, quinine, and strychnia as a tonic, and was given extra diet. Urinary examination, it is said, showed no albumen.

His health improved somewhat, and, as hot weather was liable to depress him, it was determined, after due consideration, that an attempt at operation was justifiable. On May 26, 1880, after taking fifteen grains of quinine and a dose of whiskey, he was prepared for lithotomy. Even then his feeble circulation and nervous agitation were subjects of remark, but the consultation had already taken account of his debility, and decided that operative treatment was proper. Two fluidrachms of ethyl bromide were administered by the resident surgeon in the ordinary way, and, as there was considerable struggling, another drachm was added a little afterwards. At a later period a fourth drachm was poured upon the towel. During the earlier stages of the administration I had my finger constantly upon the pulse, but, as it became necessary for me to hold the staff, I requested a bystander, well known as an administrator of anæsthetics, to watch the patient during the progress of the operation.

Just after the cutaneous incision had been made by Dr. Levis, the gentleman mentioned called the resident's attention to the imperfect respiration. The towel was removed from the face at once, and the cheeks slapped to induce inspiration. *The lips at this time were pinkish, and no marked cyanosis was noticed.* As

[1] Philadelphia Medical Times, July 17, 1880. By John B. Roberts, M.D., Lecturer on Anatomy and on Operative Surgery in the Philadelphia School of Anatomy.

only one or two feeble inspiratory efforts could be observed, the patient was inverted, nitrate of amyl given by inhalation, artificial respiration instituted, and the galvanic battery applied to the neck and epigastrium. The tongue was drawn forward to give free access of air to the larynx. All efforts, though continued for a long period, were unavailing, and for a considerable time before these procedures were stopped it was evident that life was extinct.

The whole time of anæsthesia, unfortunately, was not taken, nor does it seem possible to give accurate notes of the phenomena immediately preceding the cessation of respiration. The history I have given has been obtained from Dr. Levis, the resident physician, and my own observation during the time of anæsthesia.

The autopsy was made about two hours after death by the coroner's physician, Dr. J. G. Lee, who found the following conditions:—

Commencing rigor mortis. In left perineal region an incision two inches long, penetrating skin and superficial fascia. Tissues of scalp congested. Membranes of brain congested, ventricles containing a small amount of clear serum; brain-substance normal; membranes of medulla oblongata congested; substance of medulla anæmic. No odor of ethyl bromide perceptible. On opening body, some slight odor of ethyl bromide was noticeable. The apex of upper lobe of left lung was bound to thoracic walls anteriorly and posteriorly by old (circumscribed) pleuritic adhesions. Upper lobe was partially consolidated, the lung-tissue containing a number of cavities, with caseous and purulent deposits. Upper and lower lobes of right lung bound to thoracic walls anteriorly and posteriorly by old pleuritic adhesions. Lung-tissue consolidated and filled with cavities of various sizes. Trachea and bronchi contained a small amount of pus, otherwise normal. Right side of heart dilated, auricle and ventricle containing post-mortem clots. Concentric hypertrophy of left ventricle, which was contracted, and contained a very small post-mortem clot. Left kidney enlarged and diseased; right kidney enlarged; liver normal; intestines normal. Concentric hypertrophy of the bladder, which contained at its neck two encysted calculi.

Such were the gross appearances of the organs. The microscopic examination was made by Dr. Longstreth, the pathologist

of the hospital, and is as follows. The delay in publishing the case after writing the first part of this article is occasioned by the time occupied in obtaining this careful statement of the microscopical appearances:—

The examination of the kidneys showed that the inflammation of the pelvis of the organ was extending to the kidney itself. This condition was visible as whitish streaks running in the course of the straight tubes of the medullary pyramids, and also within the cortex itself. The microscope confirmed the naked-eye appearance. The inflammatory matter did not show any tendency to break down into purulent material; it was rather of the nature of an infiltration. It is probable that in a short time cheesy blocks would have been formed in the kidneys as the result of this process.

The morbid process in the lungs was a catarrhal pneumonia; no tubercular deposits were to be seen.

The heart-fibres exhibited atrophic changes such as are so frequently present in advanced lung-disease, but there was no fatty degeneration."

In subjecting the new anæsthetic to this most severe test we do not think our friend Dr. Levis was doing justice to it; knowing the extreme debility of the patient, and that the most simple nervous shock would render him liable to death. Hundreds of patients have thus died. Again, when ordinary ether, chloroform, or other anæsthetics cause fainting, which was no doubt the result in this case, artificial respiration has to be resorted to; now we were reliably informed that when this useful means was resorted to by alternating and relaxing the chest walls, *the pus which was in this boy's lungs was forced into his bronchial tubes and trachea, and suffocated him.*

In some recent experiments on animals we crowded four ounces (the quantity stated to have been used by Dr. Sims) upon a dog for several minutes, by means of a tin inhaler, until he became apparently dead, with no perceptible action of the heart or lungs, but his expression of eye was clear, and the pupil was dilated, while there was no secretion from the eyes or nostrils. The apparatus was removed in the space of four minutes, and he was exposed to the air, when at once he began to breathe, and by the end of the six minutes he had almost entirely recovered consciousness.

The dog did not seem much inclined to move for ten or twelve

minutes afterwards. While this dog was only partly under the influence of this anæsthetic, having at first caught the inhaling apparatus with his under teeth, there was a good deal of rigidity, and slight tetanic movements of the extremities, but this was overcome by the free use of the ether. Now, had we been using chloroform, before we would have been ready to perform any experiments upon the animal, he would have been dead, and no removal of the anæsthetic nor the introduction of atmospheric air, would have been of any avail. Again, if Squibb's rectified, and absolute ether had been employed; we must have super-saturated the animal, and been annoyed by the expectoration of large quantities of mucus. Then we frequently have seen tetanic convulsions, requiring several assistants to hold the patient, with great reduction of temperature, from the use of ordinary ether. The rapidity of the anæsthetic action of hydrobromic ether and its rapid elimination from the system by the lungs, are two of its chief merits for all operations that are not prolonged. If an operation is to be very tedious, and requires from one to two hours, we would advise the additional use of purified sulphuric ether to the anæsthetic. *We would, therefore, recommend pure hydrobromic ether in operations not lasting over forty minutes.* There is one great advantage in the use of this agent, that the administrator must attend to the anæsthetic all the time, he cannot watch the operation and forget the patient, even for a few seconds, his whole attention must be given to keep up its action. We have often felt sure that the napkin, from the water in the ordinary ether pressed over the patient's mouth by the weight of the body of the persons giving the ether and watching the operation, was the indirect cause of the death of the patient. Within the last few days we have employed it in labor for the second time, and it has peculiar advantages in that it is so rapid in its effects, and the patient is comforted between the pains, but never passes into such a state of profound anæsthesia, that she is aroused by the expulsive efforts, and has all her consciousness about her, and none of the depressing efforts of ether or chloroform. It is also most valuable in these cases in changing the position of the child, also in bringing forward the neck of the uterus into its proper position. In neither of these instances was there disturbance of the bowels, or pain in the back or head. To the country practitioner who has to extract teeth or perform all the minor operations in surgery, it is

a great boon, as it acts like nitrous oxide gas. It is well, where a number of teeth are to be extracted, that a prop of hard wood attached to a string should be used, so as to prevent such an accident as once occurred in Philadelphia, under the use of nitrous oxide gas, as the swallowing of a prop of cork. In many cases where you do not want a very profound narcotism, with hydrobromic ether, the muscles of the patient become rigidly contracted. This condition occurred on a recent occasion, when we administered ℥j of this anæsthetic, and the operator's fingers were caught and pinched, as also his forceps, and yet before operating we could touch the cornea with impunity. Although the impression passed away very rapidly, we extracted twelve teeth with entire success, the patient promptly recovering consciousness, and not feeling the pain. In the following case the patient went under it very kindly. This patient was a man of very nervous temperament. With three drachms of the hydrobromic ether anæsthesia was produced without any struggling, and in four minutes from the time he had commenced to inhale it, the dentist had extracted ten teeth, and the patient had fully recovered consciousness, although he had just eaten a heavy breakfast of solid food. There was no nausea in either of these cases.

In a recent case of cataract extraction the patient went beautifully under the influence of the anæsthetic, extraction was accomplished, and the patient recovered so as to be able to count fingers; yet owing to some strong coffee which she drank, to dyspeptic symptoms, or the swallowing of water soon after the operation, she became very sick at her stomach, and vomited for nearly twenty-four hours, and yet the case did well. In a case of operation for torticollis in a woman, she swallowed so much air with the ether, that as a consequence she complained of pain, of a hysterical character, in the lower part of the abdomen, the same as that which often results when nitrous oxide gas is inhaled and too much air is admitted.

A few days ago we received a letter from Dr. J. Patterson Cassells, of Glasgow, a distinguished aurist, and a surgeon to the celebrated Glasgow Infirmary; he writes that he has used a specimen of the hydrobromic ether which we gave him at Cork, as vapor, in diseases of the middle ear, and has also employed it as an anæsthetic with success.

We can only add that we sincerely regret the fact of the new

anæsthetic having been employed in *a case absolutely unsuitable for any anæsthetic whatever*, and upon one of the hottest of days, in the month of May, known for twenty-five years.

It has certain characteristics which are valuable, namely: its pleasant odor and taste, its soothing influence upon the brain in relieving headache, its rapidity of action, and the small quantity necessary to keep up anæsthesia. It requires a watchful care, lest, from rapidity of elimination, the patient come quickly from under its influence by means of the respiration, which as a rule it accelerates.

In most instances it does not depress the action of the heart, but always increases it; still, like a willing horse, the agent must not be driven to heart-exhaustion. Nausea and vomiting are common to all anæsthetics, especially if food is taken of a solid character; and it is proper in some cases to anticipate this by the use of slight counter-irritation, a portion of brandy and ice or lime-water and milk prior to the administration or immediately after it. The use of water should be avoided immediately after the free use of any anæsthetic, as it is apt to cause persistent vomiting.

The vapor of this ether is not at all irritating to the lungs, indeed it is the contrary, for we have found it to relieve cough and increase expectoration. After chloroform or ordinary ether has been employed so as to produce profound anæsthesia, for hours the patient will be unable to talk or walk, while after this agent the patient quickly regains his powers of co-ordination and locomotion, and is able to talk, stand, and even walk immediately on awakening from complete anæsthesia.

In all operations on the eye it has a most decided advantage over all other anæsthetics, as the pupils dilate as soon as complete anæsthesia is induced, and as the influence passes off the pupils resume their normal condition.

The vapor of this ether is not inflammable, and when poured upon a flame it will extinguish it; it is therefore free from the numerous and often dangerous accidents which occur at night when operating, when an open flame has to be used, or when it is necessary to employ the actual cautery.

This agent is not as irritating to the skin of the face or lips as chloroform.

With this ether the anæsthetic effects are sufficient in all ordinary operations—indicated by a deep, quiet sleep without

snoring or puffing, and it never should be employed with the freedom of ordinary ether, but the assistant must watch the patient, adding from time to time one fluidrachm, so as to maintain uniform anæsthesia.

The hydrobromic ether has now been employed all over the country in both large general and special hospitals, and in the private practice of the physician, surgeon, and dentist, under all conditions and circumstances, giving a full and fair test of its merits, and its success so far has been good, and except in a very few instances entirely satisfactory; but, like all potent agents, it must be employed with care and caution. So far as we are able to judge, it is the most agreeable and rapid anæsthetic yet brought before the medical profession.

I have endeavored in all my publications, from the first, in July, 1877, to the latest, in 1880, to give to the profession not only the favorable action of hydrobromic ether as an anæsthetic, but also all the unfavorable or disagreeable and dangerous symptoms resulting from its use. I have already dwelt upon the fatal case of Dr. Sims, and I now record what has been stated by others in confirmation of my views on this subject.

Dr. Leartus Connor states in an editorial, May, 1880: "From the carefully elaborated report of the above-mentioned case, and from the discussion that has resulted therefrom, we are not convinced that the anæsthetic was the prime cause of the death. In Dr. Sims's case the vicious circle had been maintained so long as to markedly impair all vital action of every organ in the body. We can understand that these organs should give way when called upon to endure the burden of an operation lasting for an hour and a half, and involving the most sensitive tissues of the body. There does not seem to be any reason to believe that a more fortunate result would have followed the use of ether or chloroform."

Dr. Wm. Brodie, in an equally dispassionate discussion of the subject connected with this death from hydrobromic ether, writes: "Following the report of Dr. Sims's case, comes one from the editor of the *Chicago Medical Gazette*, and another from Prof. Donald Maclean, of the University of Michigan. The effect of these has been to create a suspicion which has put a stop to further trials which the profession felt encouraged to make from the favorable reports of Drs. Turnbull and Levis."

"It becomes us, now that an examination has been made

of the samples giving rise to the untoward results reported, to inquire whether the suspicion thus cast on bromide of ethyl is just; the evidence in our possession leads us to say very positively that it is not. We are in a position to affirm that preparations have been employed which were not bromide of ethyl, that they contained impurities to which the untoward effects were due. Bromide of ethyl gives reactions differing in several very essential points from those of the impure preparations which have been placed on the market. In some of these preparations chloroform has been found. Now under no possible circumstances could chloroform be generated in the manufacture of bromide of ethyl. Its addition must have been deliberately made. The union of chlorine and bromine makes a very dangerous compound, and the addition of chloroform to the bromide of ethyl, with a view, doubtless, to reduce the cost of the so-called bromide of ethyl, would be the work of some one ignorant of the dangers of such a union. Sophistication under any circumstances cannot be too roundly condemned, but when it is resorted to in preparations of this nature, it becomes positively criminal.

The experiments with bromide of ethyl flatly contradict Dr. Squibb's views of the possible direct cause of death in Dr. Sims's case. It will be remembered that Dr. Squibb gave it as his opinion that the bromide of ethyl is a very unstable compound, and that its breaking up in the system was the probable cause of the deleterious consequences in the case noted. The bromide of ethyl is, on the contrary, a very stable compound, and much less easily broken up than chloroform itself."

Since the publication of Dr. Sims's case individuals have become unusually alarmed at what they considered dangerous symptoms from hydrobromic ether. Some of these may be owing to impurities in the compound, or to adulteration by chloroform. Read the report of what is stated to have been an accident from hydrobromic ether in a patient under the care of Dr. A. Wellington Adams,[1] of New York. The effects were truly like those from nitrous oxide gas. The "feeble pulse," we think, must have been owing to the Doctor being frightened by the facial cyanosis, with venous and arterial turgescence. The respiratory movements were imperceptible, the eyes turned upwards, and the jaws locked (this is sometimes the case in the early stage in

[1] New York Hospital Gazette, May, 1880.

all anæsthesia), the body somewhat stiffened; "here was evidently the neglect to watch the patient, and prevent the tongue from falling back so as to close the glottis." One of the great advantages of this agent is, as we have before stated, that in its administration the anæsthetic cannot be neglected even for a few seconds. Again, if the agent had been all chloroform, and such a series of symptoms had shown themselves, no means which he could have employed would have saved the patient's life, nor would recovery have occurred in a few minutes, as happened with his patient. The elimination of chloroform from the system is very slow, while that of hydrobromic ether is very rapid. In referring to the chief causes of death from chloroform in the table of 370 deaths from this agent, in the last edition, *op. cit.*, p. 117, it will be found that the largest number were caused by collapse, then shock, followed by syncope, and lastly, direct paralysis of the heart, admitting of no recovery. In a number of instances chloroform caused death at the first inspiration.

I will again call attention to the physiological experiments, and give the conclusions in brief. "I would also again refer to our own and Drs. Nunelley and Lee's post-mortem examinations on animals after death from hydrobromic ether.

1. Chloroform increases the pulse, then slows it by cardio-inhibitory stimulation, whilst bromide of ethyl increases the pulse by an action upon the heart itself.

2. Chloroform reduces blood-pressure by paralysis of the main vaso-motor centre and cardiac debility. Bromide of ethyl increases it by stimulation either of the spinal or peripheral vaso-motor system.

3. Chloroform increases, and then decreases, respiration; bromide of ethyl decreases it by central action."

At p. 77, *op. cit.*, the pulse, under the influence of hydrobromic ether, is seen to increase from 86 to 160, and the respiration from normal to 30. There are also reported two cases in which muscular rigidity was noticed; one case by Drs. C. S. Turnbull, Stirling, and Agnew; in reference to the other case, on which we operated at Jefferson College Hospital, Prof. Gross made the remark, after the patient had consumed two ounces of the ether, and yet was not truly under its anæsthetic influence, "Doctor, he is as stiff as a poker."

What we consider we have most to fear in hydrobromic ether

is great rapidity of respiration with no true relaxation, as in Dr. Sims's case; for, as seen by the Doctor's report, the respirations increased to sixty a minute, yet the conjunctiva was sensitive. In such cases it is like the effect produced on a fine, spirited horse by driving him beyond his powers, when he is sure to die from the results following excessive action of the heart.

There are certain cases in which hydrobromic ether will not be suitable as an anæsthetic, just as there are cases in which, no matter how much ether or chloroform you employ, you cannot bring the patient fully under their anæsthetic influence. We have never stated that this agent was superior to all others, *or even to ether, in prolonged operations.* This last fact we have stated emphatically, and it has been published extensively by a firm in Philadelphia, and sent all over the country. What we hoped for and desired was a non-irritating, safe, pleasant, non-inflammable agent, as an anæsthetic, that would be intermediate between the disagreeable, prolonged, and often disgusting odor and effects of ordinary ether, and the valuable, agreeable, yet very dangerous ones of chloroform. In the use of all agents which produce or are pushed so as to cause profound anæsthesia, which is a state of the system on the very borders of death, there always will be danger; but there are conditions of the system in which there is a happy anæsthetic state in which almost all ordinary operations can be painlessly performed with a very small proportion of risk to the patient's life, and yet prove a great blessing to those who have to be operated upon or suffer the agonizing pain from a supersensitive nervous system.

Because dangerous symptoms have shown themselves occasionally, in the use of this new anæsthetic, we must not forget how many serious cases occur to every active surgeon. In conversing with a surgeon of large practice, who has employed all the anæsthetics and hydrobromic ether quite extensively, we desired him to give us his experience; he stated that he, when about to operate in a case of ovariotomy, found the patient was dead on the table, and the chloroform was given by an intelligent physician.[1] Again, in five other cases, in four of

[1] See also another recent death from chloroform, in a case in which there was given only two drachms for simply making a thorough examination of the uterus, with a view to operative measures for the removal of a uterine polypus. Dr. Dale gave at first ether, then ether with chloroform, and, lastly, chloroform alone. All went well for the first eight or ten minutes, when suddenly, all was

which ether was administered, he had in each case to resort to position, and prolonged artificial respiration, with the tongue drawn out with a tenaculum forceps. Within only a few days, when performing perineal section, the assistant stated that the patient did not breathe well, and he had therefore withdrawn the ether (Squibb's); and when he looked, he found respiration ceased, and the patient had no pulse at the wrist, nor could his heart be heard to beat; he was literally dead. He at once thrust a tenaculum forceps into his tongue and drew it forwards, turned his head down and his feet up, and resorted to artificial respiration for two full minutes before there was the least effort to breathe; these were minutes of the most intense anxiety, and it was with the utmost joy that he noticed, after some twenty-five to thirty efforts, that the heart again began feebly to beat. He stated that he has had but two cases in which he felt much uncertainty in regard to the life of the patient, with bromide of ethyl, and in no case had he to resort to artificial respiration.

We do not desire to state that dangerous symptoms may not show themselves during the inhalation of hydrobromic ether or bromide of ethyl, but thus far they have been comparatively slight in my hands.

It is also true that most of my patients have not taken a large quantity of this form of ether (not exceeding f℥v); and most of my operations have been performed in a state of semi-anæsthesia, the patient feeling no pain, except perhaps at the very conclusion of an operation.

Hydrobromic ether, like nitrous oxide gas, produces a rapid and pleasant insensibility to pain. There is not the slightest doubt in my mind that the patient awakes to consciousness in a much shorter time than from either ether or chloroform. When dangerous symptoms show themselves, we have already directed what is to be done: draw out the tongue with a double tenaculum forceps, one prong above and one below, and have it held firm; the position of the body is very important; if there is anæmia of the brain, the feet should be held up, and the head down, while nitrite of amyl is to be applied to the nose, a few drops repeated, until it flushes the face. If you have unconsciousness with muscular spasm, employ, besides the above means,

over. Reported by Mr. Arthur Geo. Blomfield, House Surgeon Lynn Hospital. London Lancet, Feb. 14, 1880.

electricity, one pole to the chest, and one to the spine, ice at the back of the neck, and bottles of hot water to the feet. There is a certain class of patients of a nervous temperament, who, when they are in an exhausted condition, are much more impressible to the effects of all anæsthetics, and bromide of ethyl is no exception in this respect. Some of these patients may be unconscious from one to two hours, and yet with proper care recover entirely, if the system is in a fair state of health, with no disease of the kidneys, lungs, or heart. The following physicians agree with me in not arriving at too hasty a conclusion in regard to this valuable agent, even after the fatal results ascribed to it, but still feel willing to test its powers longer, with care, before condemning it. Dr. A. W. Adams,[1] of Colorado, who had almost a fatal result from it, says, from his experience in its use, that, "in view of its patent virtues, *i. e.*, its rapid impression, the promptness of recovery from its influence, its agreeableness, and the non-combustible character of its vapor, it is worthy of a most extensive trial and investigation."

Dr. W. H. Hingston,[2] Montreal, Canada, has employed no other anæsthetics, after numerous trials with it. He states "that there is less resistance and struggling on the part of the patient. Vomiting is less frequent. The ether is eliminated from the body more rapidly than any other anæsthetic, except nitrous oxide gas." He considers that bromide of ethyl is one of the most valuable anæsthetics hitherto used.

M. Terrilon, of Paris, says that in no case has he observed any phenomena the nature of which would cause fears of asphyxia; neither does the ethyl bromide seem to cause syncope.

It has been used in France in cases of carcinoma, neuralgia, and sleeplessness; and also in Germany, by Drs. Winckel and Fiedler, in neuralgia, myoma, and beginning epithelioma. Their experience determined its powers as unmistakably anodyne and hypnotic, the method of administration being to give it suspended in water, in doses of from ten to twenty drops. Dr. Roberts, of Philadelphia, gave it in angina pectoris, with recovery. By my long use of hydrobromic ether, from June, 1876, to 1880, in many hundreds of cases, without any fatal results or very serious symptoms (the ether being first made by Prof. Remington, then by Dr. Green, and last by John Wyeth & Brother, and still more recently by Parke, Davis & Co.,

[1] New York Medical Gazette, May 1, 1880.
[2] Canada Medical Record, June, 1880.

of Detroit), I became convinced that the specimens of ether employed in both of the fatal cases lately reported might have had in themselves some toxic agent. I therefore procured from Powers & Weightman, Wyeth & Brother, Dr. L. Wolf, of Philadelphia, and Parke, Davis & Co., of Detroit, specimens, and placed them all in uniform one-ounce bottles, carefully marking them all alike, and placing no name but simply a number on them. I then wrote a letter to Professor George F. Barker, of the Academical Department of the University of Pennsylvania, desiring him to make a careful examination of each specimen, and to have it ready for me as soon as possible, as I desired to present it at the meeting of the American Medical Association at New York in May last. I regret it was not ready then, but I have taken the liberty of adding it to my report, feeling the great importance of the subject; also appending such additional information as has been noted to date. In this connection, I take the opportunity of thanking Prof. Barker for the kindness he has displayed in complying with my request. I will now give the correspondence, and the result of the examination, as far as it has been carried.

3909 Locust Street,
Philadelphia, May 28, 1880.

My Dear Doctor:

I placed the specimens of ethyl bromide which you sent me in the hands of one of my special students immediately upon their receipt, and intended to determine pretty accurately the physical characters of the samples: such as the specific gravity at 0°, the expansion coefficient, the vapor density, the boiling point, etc. Then I purposed saponifying the ethers, and determining the impurities chemically. My student is now at work on the specific gravity, and, as but a few hours of time per week is spent at it, progress has been slow. Had I known that you desired to use the results in a paper before the American Medical Association, I would have hurried them up a little. As it is, if you must leave to-morrow, I fear nothing will be ready for you to take with you.

Truly yours,
GEORGE F. BARKER.

Dr. Turnbull.

University of Pennsylvania,
Philada., July 13, 1880.

My Dear Doctor:

I have completed some of the physical measurements on the samples of ethyl bromide you sent me, and I send you herewith the results, thinking that even these may possibly be of service to you.

I have examined the specific gravity and the coefficient of expansion.

A.—Specific gravity at 0° C.

Sample 1	1.44
Sample 2	1.45
Sample 3	1.25
Sample 4	1.47

According to Pierre, pure ethyl bromide at 0° has a specific gravity of 1.47329.

B.—Expansion coefficient.

Sample 1	.001268
Sample 2	.001278
Sample 3	.001255
Sample 4	.001344

The expansion coefficient, according to Pierre, at 0° C., is .001337.

From these data you will see that sample 4 is the purest, and that then follow 2, 1, 3. The last is very impure.

I propose to continue this examination in the fall, and to determine the impurities, if possible.

Enough has been done, perhaps, to assist you in selecting the purest sample for anæsthetic use.

Yours truly,

GEORGE F. BARKER.

Dr. Laurence Turnbull.

Sample No. 1 was made by Dr. L. Wolf, of Philadelphia.

Sample No. 2 was made by Parke, Davis & Co.

Sample No. 3 was made by Powers & Weightman, of Philadelphia.

Sample No. 4 was made by John Wyeth & Brother, Philadelphia.

I have but little further to add but the truth, which ought in all cases to be stated. The agent employed by Dr. M. Sims, in his fatal result, was made by Messrs. Powers & Weightman, of this city,—I had the opportunity of examining a part of it, which remained after the operation; and the specimen employed by Dr. Levis, in his fatal result, was made by Dr. L. Wolf, of Philadelphia. While I feel convinced that an impure agent may have hastened a fatal result, I am sure that there were important changes in the system and tissues of the individuals which greatly favored a fatal result.

In conclusion, I would make the following claim for pure ethyl bromide as an anæsthetic agent:—

1. It is efficient.
2. It is agreeable.
3. It is evanescent in its effects; patients coming readily under its influence, and speedily recovering after the operation is completed.
4. It is safe, when administered in competent hands.
5. It is cheap, in view of its prompt action, and small amount required to produce complete insensibility.
6. It is the best local anæsthetic known.

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[1] For the main part of this Bibliography we are indebted to H. Augustus Wilson, M.D., author of Anæsthesia by Ethyl Bromide. See "Philadelphia Medical and Surgical Reporter," August 7, 1880. With additions by the writer.

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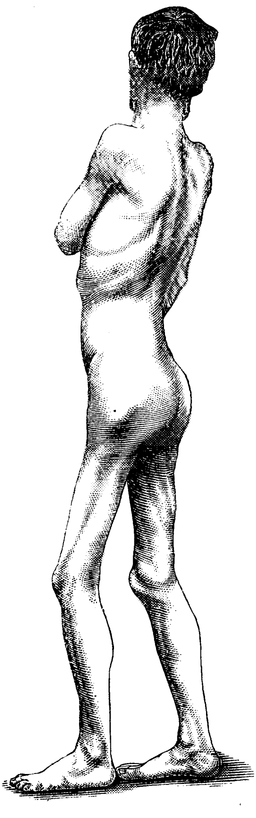
Case I.



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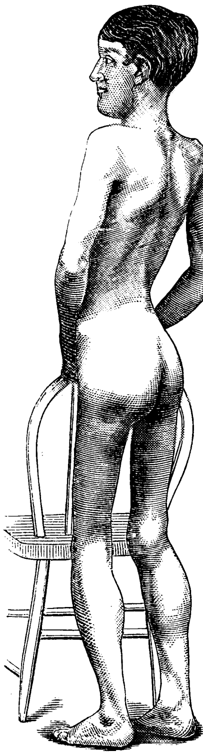

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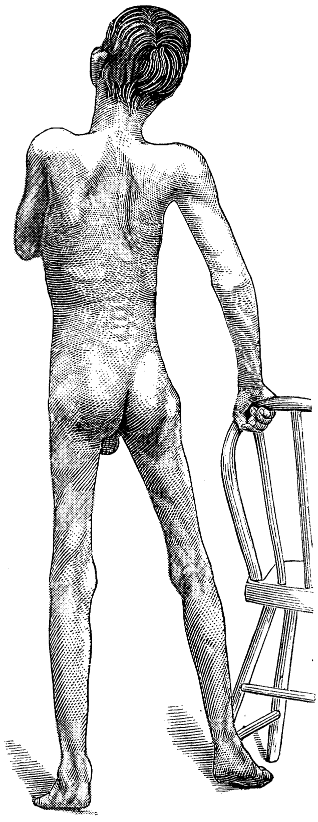

THREE CASES OF PROGRESSIVE MUSCULAR DEGENERATION.

By I. N. KERLIN, M.D.,
Superintendent of the Pennsylvania Institution for Feeble-Minded Children,

AND

CHARLES K. MILLS, M.D.,
Neurologist to the Philadelphia Hospital.

The three patients discussed in this paper are three brothers, who have been for several years inmates of the Pennsylvania Institution for Feeble-Minded Children at Media.

Case I.—J. M., the eldest of the brothers, was, when examined in January, 1880, twenty-eight years old. At the time of his birth, the age of his father was only twenty-one years, and that of the mother eighteen years. He showed signs of deficient animation at birth. He was the first-born of the family. When between four and five months old he had convulsions, but not afterwards. During infancy he was troubled with indigestion and diarrhœa. His parents noticed that his limbs seemed weaker than those of other babies of the same age. He could not walk until he was four years old. He was admitted to the Pennsylvania Institution for Feeble-Minded Children in 1873. Unfortunately, no facts of value in regard to the condition during childhood, of either this patient or his brothers, could be obtained.

His weight was 83¼ pounds; height, 5 feet 4½ inches. He had almost the appearance of a living skeleton, except in the gluteal regions and the calves, which were better developed than other portions of the body. The muscles of the back, and of the chest and abdomen, were very much atrophied; those of the shoulders, arms, and forearms were also wasted, but not quite so markedly; in the lower extremities the wasting was most pronounced in the thighs. His mouth was full and firm. His hands were well shaped. The face, eyes, and limbs showed no

localized paralyses, and no deformities or contractures. The wasted muscles were, however, weak, the weakness varying in different muscular groups. Both grips were poor, the left better than the right. The extensor muscles of the thighs were extremely weak; lying in bed, he could flex the thighs on the pelvis, but not readily; and he could only extend them again by a wriggling, downward movement, performed with great effort.

The following measurements were made: right semi-circumference of the chest, $13\frac{1}{2}$ inches; left, $13\frac{3}{4}$ inches; right semi-circumference of abdomen, $12\frac{5}{8}$ inches; left, $12\frac{1}{2}$ inches; length of the right arm, 26 inches; of left, 27 inches; circumference of middle of right arm, $7\frac{3}{8}$ inches; of left, $7\frac{1}{2}$ inches; right forearm, $5\frac{7}{8}$ inches; left, $7\frac{1}{4}$ inches; length of right leg, 33 inches; of left, $33\frac{1}{4}$ inches; circumference of right thigh, $10\frac{1}{4}$ inches; of left, $10\frac{1}{8}$ inches; right calf, $10\frac{1}{8}$ inches; left, $10\frac{3}{4}$ inches.

In standing, his feet were planted widely apart, one in advance of the other. The upper part of the trunk was thrown far backward, and the belly forwards, producing a characteristic lordosis, the scapulæ assuming a wing-like appearance. The upper part of the spinal column showed a slight lateral curvature to the left. Without support he could stand only for a few minutes. In walking he carried himself in the same position as when standing, lifting himself forwards with a twisting and swinging movement on the balls of his feet. He could only move along very slowly, assisting himself by taking hold of anything within reach.

Farado-contractility was retained in varying degree, being least in those muscles which were weakest and most wasted. It was diminished in all. Fibrillary tremors were not observed during any of the examinations. Good reflex responses could be brought out from the skin. The patellar reflexes, however, were abolished. His hands and feet, on slight exposure, rapidly became cold and blue, but this condition did not remain. Numerous yellowish patches were scattered over his chest and abdomen. Hair was scanty on his head and face, but comparatively abundant on his body. He complained sometimes of sensations of numbness, and frequently of feelings of fatigue and soreness in his limbs and body. Cutaneous sensibility—tested for touch, pain, pressure, heat, and cold—was found to be

normal. Electro-muscular sensibility was lowered. Hearing was diminished in acuteness about one-half in each ear. Accommodation was good, but acuteness of vision was considerably decreased. His eyes were large, gray, staring, and apt to be fixed in one direction. He was slow in concentrating his attention on objects of sight and hearing. His speech was slow, and slightly hesitating. Appetite and digestion were good, but he showed some tendency to constipation. He was of energetic disposition.

Physical examination of the lungs showed some dulness on percussion, both at apices and bases; it was greater on the right side. Vocal fremitus was increased, and the lungs did not properly expand. Inspiration was short, expiration prolonged. The abdomen was not thrown forward as in normal respiration. Respirations were 24 to the minute. Lately he had had frequent coughing spells with yellowish expectoration. The impulse of the heart was weak, but no murmurs were present.

During the last seven years, two or three times annually, he had had febrile attacks lasting several days, and accompanied by pains in the back and limbs. After these spells a notable decrease in strength was always observed.

Case II.—H. M. was twenty-two years of age at the time of examination. He never had convulsions, but he suffered during infancy from digestive and intestinal disorders, and early gave evidences of muscular weakness. The exact age at which he became able to walk could not be learned.

His weight was 80$\frac{3}{4}$ pounds; height 5 feet 1$\frac{1}{4}$ inch. The size, shape, and contours of trunk and limbs were better in this patient than in either of the other two. The muscles of the trunk, upper extremities (except the deltoids), and thighs all exhibited decided wasting. The calves of both legs were, however, enlarged, presenting a pseudo-hypertrophic appearance. He had slight left lateral curvature of the spine. He walked with his shoulders and arms thrust backwards, the latter being flexed and tense, and the fists clenched. His feet were without spring, and his mode of walking caused a sort of rocking movement of the pelvis. His method of rising from a sitting position on the floor was that described by Gowers and others as "climbing up the thighs."

The gluteal muscles and deltoids were also somewhat enlarged.

Weakness, but without definite palsies or deformities, was the condition here as in the first case. He did not seem to have ready control of the movements of his eyes and face.

The following were the measurements: Right semicircumference of the chest, $14\frac{1}{2}$ inches; left, $14\frac{5}{8}$ inches; right semicircumference of abdomen, $12\frac{1}{4}$ inches; left, $12\frac{3}{8}$ inches; length of right arm, 27 inches; left, 27 inches; circumference of middle of right arm, $7\frac{7}{8}$ inches; of left, 8 inches; right forearm, 8 inches; left, $7\frac{7}{8}$ inches; length of right leg, $38\frac{1}{2}$ inches; of left, $38\frac{1}{2}$ inches; circumference of right thigh, 11 inches; of left, $10\frac{1}{2}$ inches; right calf, $12\frac{1}{4}$ inches; left, 12 inches.

He could stand alone with his heels together for a few minutes. He stood by preference with his feet well separated. The shoulders and upper part of the trunk bent backwards, but not as markedly as in the other cases.

In regard to farado-contractility, fibrillary tremor, superficial and deep reflexes, vaso-motor manifestations, sensibility, and special senses, attention, speech, and general state, the conditions in this case were practically the same as those shown by the elder brother. None of the yellowish patches were present on the skin.

Respiratory movement was imperfect. A slight aortic regurgitant murmur was present. The pulse was 80, and somewhat feeble and irregular.

For several years every two or three months he had had attacks of acute illness, the chief symptoms being nausea, vomiting, constipation, fever, cough, and muscular soreness.

Case III.—F. M. was seventeen years old at the date of examination. His history during infancy was the same as that of each of the other boys. He never, however, like the oldest, had convulsions. When admitted to the Institution, the disease was less marked than in either of the other cases, but since admission his downward course had been the most rapid of any.

His weight was 74 pounds; height, 5 feet, $2\frac{1}{4}$ inches. In this, as in the other cases, the muscular structure of the trunk and thighs showed the greatest wasting. All the muscles of the trunk were remarkably atrophied. The glutei muscles and those of the calves were comparatively large; and the muscles of the upper extremities were not so much wasted as other parts of the body. Palsies and deformities were absent.

The measurements were as follows: Right semi-circumference of the chest, $14\frac{1}{2}$ inches; left, $14\frac{3}{4}$ inches; right semi-circumference of abdomen, $11\frac{7}{8}$ inches; left, 12 inches; length of the right arm, $26\frac{3}{4}$ inches; of left, $27\frac{1}{8}$ inches; circumference of middle of right arm, $6\frac{7}{8}$ inches; of left, $6\frac{3}{4}$ inches; right forearm, 7 inches; left, 7 inches; length of right leg, $38\frac{3}{4}$ inches; of left, $39\frac{1}{8}$ inches; circumference of right thigh, 11 inches; of left, $10\frac{1}{2}$ inches; right calf, $12\frac{1}{4}$ inches; left, 12 inches.

He could not stand without support for more than a minute. It will be unnecessary in this case to go into details in regard to standing, walking, sitting down and rising, farado-contractility, fibrillary tremor, reflexes, vaso-motor and sensory symptoms, state of lungs, etc. The conditions and manifestations were strikingly similar to those found in the other two cases, differing only in degree.

We are led, from a study of these cases, strongly to favor the idea of the essential identity of progressive muscular atrophy and pseudo-hypertrophy of the muscles, as advocated by Friedreich and Eulenburg, who have made a thorough investigation of both diseases. Friedreich, quoted by Eulenburg, says[1] of pseudo-hypertrophy, that "it is a form of progressive muscular atrophy modified by the peculiar strength of the diathesis and by certain special attributes of childhood." Eulenburg thoroughly discusses the question of the identity or independence of the two affections. His chief arguments in favor of identity are (1) Agreement in the fundamental histological changes of the muscle; (2) The extremely frequent coincidence of pseudo-hypertrophy of single muscles with diminution in the size of others, near or remote, which are similarly impaired in their functions; (3) Essential agreement in respect to etiology and clinical course.

Gowers[2] devotes scant attention to this matter, but concludes that the pseudo-hypertrophic paralysis of early life is not a disease of the spinal cord, is not an infantile spinal myo-atrophy similar to the common forms of progressive muscular atrophy of adults.

[1] Ziemssen's Cyclopædia, vol. xiv. p. 172.

[2] Pseudo-Hypertrophic Muscular Paralysis; A Clinical Lecture. London: J. & A. Churchill, 1879.

It will be found, we believe, that Eulenburg's arguments are well borne out by a study of our cases.

By means of Duchenne's histological harpoon a small fragment was removed from the gastrocnemius muscle of the left leg of each patient. The specimens obtained were too minute for satisfactory sections to be made. Dr. G. M. Christine, however, prepared them by teazing, stained them with carmine, and temporarily mounted them in oil of cloves. They were examined microscopically by Dr. E. O. Shakespeare.

In the three specimens nearly the same condition was found. Some of the fibres presented normal appearances; in others no fibrillation could be distinguished. In some the muscle corpuscles were more or less increased in number. In a few the sarcolemma appeared to be crammed with an accumulation of embryonic cells. In some bundles the muscle fibres were not separated by more than a normal amount of interstitial connective tissue. In others, however, this tissue was both increased in quantity and was in a state of cellular hyperplasia. No fat-vesicles could be seen.

This investigation was, of necessity, unsatisfactory. As has been pointed out by Gowers and others, the use of the harpoon gives rise sometimes to mistakes, the very small specimens obtained not being sufficient to show the entire pathological condition present. We did not, however, feel justified in resorting either to numerous harpoonings or to excisions of muscle. The absence of fat-cells may have been accidental, owing to the method of obtaining and preparing the specimens. The examinations showed, at least, the existence of a chronic interstitial inflammatory process, and were, so far as they went, in agreement with the researches of Friedreich and Eulenburg, to which we will here briefly refer.

According to Friedreich's investigations, as given by Eulenburg, progressive muscular atrophy consists in an essentially inflammatory process, a "polymyositis chronica progressiva." "The first changes begin in the perimysium internum as hyperplastic growth of the interstitial connective tissue, in its finest ramifications among the single primitive bundles. At the same time there occur phenomena of irritation in a greater or smaller number of primitive bundles, in the form of swelling and multiplication of the muscular corpuscles, and especially proliferation of their nuclei, and sometimes parenchymatous granular cloudi-

ness of the cross-striped fibrillary substance. In a few cases, hypertrophied muscular fibres and a dichotomous or trichotomous division of the hypertrophied fibres (Friedreich) were seen. During this increase in interstitial tissue, the wasting of the muscular substance goes on in various ways, partly by simple emaciation and progressive dissolution, without loss of transverse striation (sometimes preceded by longitudinal, transverse, or elementary fission), and partly by waxy or fatty degeneration. The final result is a more or less *complete fibrous degeneration* (*cirrhosis*) of the muscle. An accessory process, by no means constant or essential, is the diffused lipomatosis of the muscle, which appears sometimes early, sometimes late in the course of the disease."[1]

According to these authors again, in cases of pseudo-hypertrophy, such muscles as are attacked without being hypertrophied present the same appearances as are found in progressive muscular atrophy. The abundant development of fat, interstitial and even inter-fibrillary, is not the primary fact, but is preceded by a stage of hyperplastic development of connective tissue, so that the whole must be spoken of as an irritative, inflammatory process, as in progressive muscular atrophy.

The coincidence of pseudo-hypertrophy of some muscles with atrophy of others, was particularly shown in Case II. In this patient, the enlarged calves were almost typical of pseudo-hypertrophy, although they were by no means of the enormous dimensions sometimes attained in reported cases. In the youngest of the three, the glutei muscles and those of the calves were comparatively large. Gowers, speaking of the muscular enlargement, says, "that, while pathognomonic when present in conjunction with the other symptoms, its absence is of little importance, since muscles gravely diseased may be of normal size."

In regard to etiological conditions several characteristics, some of which are illustrated by these cases, are presented almost equally by pseudo-hypertophy of the muscles and progressive muscular atrophy. Both diseases show a remarkable tendency to affect several members of the same family; in both males are much more frequently attacked than females; in both heredity has been proved to play a very important part.

Let us glance, for the sake of comparison, at some of the records of the two diseases as given by Hammond, Eulenberg,

[1] Ibid., p. 133–134.

and Gowers. Meryon gives an account of four brothers who were attacked by progressive muscular atrophy; Eulenburg, senior, describes twin brothers affected by the same disease; Eulenburg, junior, relates the particulars of a family of seven, out of which two brothers and two sisters were attacked. Friedreich's statistics show that of 176 cases only 33 were females. In one remarkable instance eight boys were attacked while four sisters were not. All of Hammond's cases but one were males. The remarkable history of the Wetherbee family will be recalled by all familiar with Dr. Hammond's treatise; in four generations nine or ten members of this family were the victims of this disease. Dr. Hammond also refers to the instructive histories related by Naunyn, who gives an account of a family in which six generations were subject to the disease.

Turning now to pseudo-hypertrophy of the muscles, we find that in four of the examples given by Gowers, the tendency to affect several members of the same family was noticeable. In one family four cases and in another six occurred. Lutz described six cases in one family. Barsichow gives an extraordinary series of twenty-four cases of an analogous malady in two connected families. Meryon mentions an instance in which eight brothers all died of this disease. Numerous cases of two children of the same parents are reported. Heller, Wagner, and Seidel report cases of three brothers; Lutz and Eulenburg of three sisters. Of 220 cases collected by Gowers, 102 were apparently isolated, and 118 were grouped in thirty-nine families. It is probable, however, as this author says, that these statistics underrate the frequency with which more than one member of a family is affected because, in many of the examples, other members of the family were young, and may have subsequently presented symptoms of the disease, and in some instances it is not evident that the point was investigated.

Of forty-four original cases described by Gowers, the relationship of the subjects of the disease was as follows: In eighteen families two brothers were affected; in five, three brothers; in three, four brothers; in one, eight brothers; in two families, a brother and sister; in two families, two brothers and a sister. In the remaining twelve families the members affected were: one boy and his uncle; three brothers and uncle; a son, aunt, and uncle; two brothers, uncle, aunt, and great-uncle; two brothers, two cousins, and two uncles; two brothers, sister, and

two cousins (also brothers); four brothers, aunt, and uncle; two sisters and brother; three sisters, uncle, aunt, and cousin. Poore[1] gives an interesting analysis of cases with reference to the occurrence of the disease in numerous members of the same family. In regard to sex, we will simply refer to the statistics of Gowers as the latest and fullest: of 139 cases, 123 were males and 16 females.

The tendency to attack males and members of the same family is, of course, illustrated by our cases.

The following are our notes upon heredity with reference to these cases:—

No history of either pseudo-hypertrophy of the muscles or of progressive muscular atrophy in the ancestry of the patients could be obtained, but we were unable to trace the family history further back than to the grandparents. Nothing could be learned in regard to collateral branches of the family. The paternal grandfather and grandmother died at 62 and 83 years respectively, the maternal grandparents at 60 and 80 years. The character of the diseases which carried them off could not be ascertained. The father died of what was pronounced to be intestinal tuberculosis. He was addicted to the use of alcohol. The mother died paralyzed when only thirty-three years old. She is said to have been deaf, scrofulous, and for several years an epileptic. She had two miscarriages and five living children —the three boys who form the subjects of this paper, and two girls, both of whom are healthy. Neither parents or grandparents were related before marriage. Each of the children was born at full term, the labors being easy. The mother was not subjected during pregnancy to any continuous anxiety or hardship, or exposed to any shock, accident, or especially painful emotion.

If pseudo-hypertrophy of the muscles and progressive muscular atrophy are looked upon as independent affections, these cases, in spite of the great preponderance of atrophy at the date of their examination, would belong more properly to the pseudo-hypertrophic type. The disease in each case began in early childhood, and pseudo-hypertrophic muscular paralysis, as described by all authors, is a disease of infancy and childhood, while progressive muscular atrophy in its ordinary form usually

[1] New York Medical Journal, June, 1875.

begins in adult life. Almost every point of supposed distinction can, however, be shown not to be absolute. We have ourselves seen one case of pseudo-hypertrophy beginning in adult life. Dr. A. Hughes Bennett[1] reports an adult case. In eighty cases collected by Eulenburg five began after adult life.

A few more points in the symptomatology of these cases are deserving of attention.

When between four and five months old the oldest of the patients had convulsions. We think it doubtful, however, whether any causative or other relations existed between this attack and the development of the disease. Duchenne and Benedikt have reported cases in which epileptiform convulsions are said to have preceded the appearance of pseudo-hypertrophy of the muscles. In two of our three patients no spasmodic attacks of any kinds had ever occurred.

It is not without interest and possible importance that the three patients suffered during infancy from indigestion and diarrhœa.

The methods of rising and of standing and walking were carefully studied in these cases. Gowers fully considers the subject of the attitude and gait of patients suffering from pseudo-hypertrophy. He also gives a series of illustrations showing the mechanism of the movements performed by these patients in rising from the floor or a chair. His remarks on the lumbar lordosis, which was so marked a manifestation in his and our cases, are very interesting.

Fibrillary tremors or contractures are looked upon by some as of pathognomonic importance in progressive muscular atrophy; and are said to be absent in pseudo-hypertrophy. These movements, in our three cases, did not appear spontaneously and were not provoked by external agencies during our examinations. These tremors are not, however, absolutely pathognomonic of progressive muscular atrophy. According to Duchenne they are present in only one out of five cases. We believe, however, that the average frequency of their presence is much greater than this. According to Wagner, Eulenburg, Rosenthal, and others, they are not infrequently to be observed in pseudo-hypertrophy. Eulenburg says that the twitchings in the pseudo-hypertrophied muscles are less striking to the eye, on account of the masses of

[1] Brain, October, 1879.

fat. They were not, however, in our patients to be seen, either in the atrophied or hypertrophied muscles.

Good reflex responses could be elicited from the skin in the three cases, but in all the patellar reflexes were abolished. According to Gowers[1] the patellar reflex is a true reflex action, depending on the integrity of the reflex loop at the level of the second and third lumbar nerves. It is impaired by disease of any part of this loop—(1) of the posterior nerve-roots, outside the cord, or in the posterior column; (2) of the gray matter; (3) of the anterior roots; (4) of the mixed nerve-trunks. It is also exceptionally absent in normal conditions. In our cases wasting of the quadriceps extensor was very marked. As different pathological investigations have revealed, in addition to muscular degeneration, atrophy of peripheral nerve-fibres, and changes in the anterior roots and in the ganglion cells of the anterior horns, we have a choice of explanations of the destruction of the integrity of the reflex loop on which the production of the knee phenomenon is dependent.

The three patients were very sensitive to cold, and the hands and feet of the two eldest became temporarily blue on exposure. Marked mottling of the skin has been observed in some of the reported cases of pseudo-hypertrophy. Painful swellings of the joints, large or small, had never been present. Fatigue-pains and sensations of numbness and crawling were among the sensory manifestations. Electro-muscular sensibility was diminished. This has been usually found to be the case in progressive atrophy; in pseudo-hypertrophy, according to Eulenburg, it is sometimes increased and sometimes decreased. Physical examination of the chest seemed to indicate that, besides the accessory muscles of breathing, the diaphragm, and perhaps even the heart itself, were involved in the process of degeneration.

These cases, it will be remembered, are inmates of an institution for the feeble-minded and idiotic. Although of energetic dispositions, they showed considerable intellectual deficiency. The condition of speech, and of the special senses also, indicated some cerebral involvement. We are told by Gowers that in most recorded cases the mind has been unaffected. "In some, however," he says, "there has been mental dulness, and even actual idiocy.

[1] The Diagnosis of Diseases of the Spinal Cord. London: J. & A. Churchill, 1880.

Several of such cases have been reported by Dr. Langdon Down. It appears, therefore, that mental defect is not part of the disease, but that the muscular affection is rather more common among children who have mental defect than it is among others. In a few cases on record there have been epileptic fits, probably, like the mental defect, the result of an associated, not of a related, cerebral disease."

It is evident that in all diseases in which muscular degeneration is prominent, and particularly in those in which it is the chief peculiarity, careful examinations of the urine may be of considerable value. Foster[1] considers it a more or less probable view that the kreatin found, and presumably formed, is a more or less distinct antecedent of urea. Other things being equal, in diseases in which muscular wasting is excessive, we should expect an excess of urea. Kreatin itself is not a normal constituent of the urine. Kreatinin, however, which is simply a dehydrated form of kreatin, occurs normally as a constant constituent of urine and of muscle extract.

We have been unable to find any records of urinary analyses in cases of pseudo-hypertrophy of the muscles. Eulenburg makes the following observations in regard to progressive muscular atrophy. "Concerning the qualitative and quantitative changes in the composition of the urine, there are but few and very discordant statements. Freidberg and Fromman each observed in one case a deposit of lime in the urine; the latter found the urine pale, turbid, slightly alkaline, with abundant sediments of carbonate of lime, which he believed to originate from the atrophied muscles. Bamberger, however, found in one case urea and chloride of sodium in normal or increased quantity, great increase of sulphuric acid, and considerable diminution of the uric and phosphoric acids. An examination of the blood at the same time showed a considerable increase in albumen and blood-corpuscles. More important, but not yet confirmed by other observations, is the increase of kreatinin in the urine, observed by M. Rosenthal in three cases. Friedreich found the urine acid in three cases, of quite high specific gravity, containing more or less constant sediments of urates, and free from albumen."[2]

[1] Text-Book of Physiology.
[2] Ibid., p. 128.

Analysis of Urine, February 3, 1880.

	Case I.	Case II.	Case III.
Quantity in 24 hours	976	1500	1300
Specific gravity	1013	1010	1012
Urea	13 grammes	24.3	17.55

The color was in each case reddish-yellow; reaction acid; phosphates about one-half the normal; chlorides and sulphates were only examined for qualitatively, but were estimated as nearly normal; crystals of triple phosphates were present; no albumen or sugar.

The diet for the day was as follows: Breakfast, stewed potatoes, bread and butter, and coffee; dinner, cold tongue, potatoes, blanc mange, milk, apples, and crackers; supper, bread and butter, and tea.

Analysis of Urine, May 4, 1880.

	Case I.	Case II.	Case III.
Quantity in 24 hours	1230 c. c.	1080 c. c.	1000 c. c.
Specific gravity	1016	1018	1021
Urea	20 grammes	22.5	27

Examination for color, reaction, phosphates, etc., gave practically the same results as February 3d.

Diet: Breakfast, eggs, bread and butter; dinner, farina, bread and butter, corn-starch, milk; supper, arrowroot, and milk.

On February 3d and May 4th, 1880, an investigation of the urine in our cases was made by Dr. D. W. Jefferis, assistant superintendent to the Institution for Feeble-Minded Children. The patients, while under observation, were kept in a warm room, under the constant supervision of a watchful attendant, so that the whole quantity of urine passed in twenty-four hours was carefully collected.

THE SALISBURY PLANS IN CONSUMPTION—PRODUCTION IN ANIMALS—RATIONALE AND TREATMENT.

BY EPHRAIM CUTTER, M.D.,
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PRELUDE.

THE writer is a witness. As such he feels compelled to state the truth. If the testimony proves a testimonial, it is still testimony. As the subject is one of the most momentous that can engage the mind of a medical man, it demands a fair hearing, and a suspension of judgment until the evidence is all in.

It is estimated that one-quarter of the human deaths is caused directly or indirectly by what is commonly called consumption. Taking man to comprise 1,500,000,000 of individuals living on this globe, and the rate of annual mortality to be one in forty-five, there is a total of 33,333,333 yearly deaths. One-quarter of this number gives 8,333,333 annual victims offered on the altar of consumption. The intellect is unable fully to comprehend this vast number. Allow us to try to measure it by some common gauges. I find I can write my name readily ten times in one minute. It would take me 833,333 minutes to write it as many times as there are annual consumptive deaths. That is, it would take 1 year, 213 days, and 16 hours of unintermitted writing simply to inscribe the names of this host, if on an average they consisted of thirteen letters.

Suppose the vast company could be marshalled in rows four deep and two feet apart, this host would reach 770 miles in length, and occupy 10 days and 17 hours in passing a given point at a continuous rate of three miles an hour.

If the coffins of this host averaged three feet in length, and could be placed end to end, they would reach 24,999,999 feet, or about 4733 miles, or farther than from here to Liverpool.

Their funerals, at an average cost of ten dollars, would sum up $83,333,333.

Bringing the matter down to the United States, with a population of 45,000,000, we have 250,000 annual deaths from consumption. A mortality of 20,000 deaths in the late epidemic of yellow fever convulsed the nation and cost $27,000,000. How can we estimate our annual monetary loss from one-quarter of a million deaths from consumption? If the deceased had been associated in an organization, it would take its secretary to call off the roll, at the rate of 36 names a minute, 4 days, 19 hours, and 44 minutes of continuous phonation.

The paper on which this essay is written is about 1-365 of an inch thick. Yet 250,000 of such sheets would make a pile 57 feet and 1 inch high.

The literature of this disease is immense. It is traced through history. Millions of medical minds have grappled with it, notably in inaugural theses and the profoundest efforts of the fathers of medicine. Seas, mountains, languages, customs, dress, manners, religions, and localities may separate nations; conditions, castes, wealth, birth, capacities, endowments, professions, colors, and vice may separate communities into classes; but the oneness of humanity is made evident by a common union in death from consumption. For ages prose and poetry have labored to express the sincere sentiments of hopes blighted, feelings wounded, hearts broken, expectations unrealized on the part of orphans and widows and bereaved parents. How many of the brightest and most promising jewels have been shorn from the diadem of our own profession by this disease! Personalities in this connection should not be offensive; but if the future can be judged by the past, one-fifth of my audience will die of consumption. As a witness I stand then between the living and the dead. Am I wrong in claiming that the subject is one of the most momentous that can engage the mind in a numerical, biological, monetary, politico-economical, domestic, sociological, literary, scientific, and religious point of view?

It is proposed, first, to give a brief account of Dr. James H. Salisbury's experiments on animals that resulted in producing consumption, and verified by autopsies. I have found nothing like them in history, in number, extent, and decision. In my opinion they throw new light on the real hidden source of this hitherto inscrutable disease. Second, having given the general grounds on which the theory is based, it is proposed to give the Salisbury rationale of consumption. Third, to present cases of

actual treatment that have come under Dr. Salisbury's and my own care.

At the outset, to anticipate queries that are apt to arise, it may be proper to state that Dr. Salisbury is a gentleman of wealth who has devoted himself to the investigation of the causes of disease for more than thirty years. He graduated at Union College in the arts, and at Albany Medical College in medicine. The list of his published works shows the variety and extent of his labors.

As to myself, I speak from a personal knowledge of this plan of more than thirteen years, and of many cases. I testify what I believe to be the truth; having done this, whatever my reception, I shall be satisfied that I have acted up to my convictions of duty in trying to make known what I know about the plans. I dislike to be thus personal, but I know that dicta are generally judged by the character of the speakers more than by the character of the communications. While then I cannot show more ability and skill, I pray those who may be interested, to look more to the facts presented than to the means of their presentation. It is possible to present a good cause badly and a bad cause ably. Thus evil may, on the ordinary modes of acceptation, be received sooner than good. But when a quarter of a million of us die yearly of a certain disease, it ill becomes one to refuse to throw any new light on it by recounting the modes in which it has been artificially produced, verified, and also has been cured, if any organic disease has been cured.

Production of Consumption in Animals.—In 1858 Dr. Salisbury had a work ready for the press detailing the experiments he made. He took two thousand swine and arranged them in lots, suited to the size of the pens. In one pen he had 624, and in an adjoining pen 404. These two pens were for testing the effects of fermenting food and the products of fermentation when used as an exclusive aliment. The balance of the swine were placed in pens for studying upon them the effects of the various mixed foods. The two pens containing 1028 swine joined two pens of 1100 swine that had been fed on the fermenting food for eleven weeks and had ceased to die. Not a hog in these pens took the disease. While, during the first ten weeks of feeding, out of the 1028 swine 246 died. After the tenth week none died. Of the 246 that died, 104 of them were subjected to a careful examination after death. In all these cases he

found the lungs exhibiting what the profession commonly calls consumption.

I have myself perused the records of these post-mortem examinations. The 1028 swine that were fed on fermenting food soon began to show its effects in diarrhœa. In from ten to fifteen days they presented the evidences of consumption of the bowels. The consumption of the lungs followed as stated. Dr. Salisbury also took men hired by the day and fed them on similar food, with exactly the same results, save that he did not push them to the pulmonal lesion. There was no need nor humanity in this. The outcome of this is briefly, that these experiments show that consumption can be caused at will by feeding in the food fermentative vegetation. We think this startling and momentous fact should become well known.

To those who object that hogs are always found diseased with tuberculosis, so that these experiments are thus vitiated, it is proper to say that all hogs are not victims of tubercle. Under date of Feb. 20, 1880, Dr. Salisbury writes: "I have made post-mortems of over one hundred well hogs, or swine that have been slaughtered where they were fed on good sound corn, and have seldom found a trace of tubercle. There never is tubercular formation unless there has been unhealthy feeding."

Remarks.—Is there anything like this in the annals of medicine? Critics may utter dislike of the man and his methods, but these facts cannot be gainsaid, unless they are carefully gone over and proved to be incorrect. Dr. Salisbury would like nothing better than to have these experiments repeated by careful, conscientious, honest, and capable observers. Indeed the writer would like to undertake this under the observation of this Association.

Having thus shown how consumption has been produced by feeding, we now pass to the consideration of the second part of our subject.

THE RATIONALE OF THE SALISBURY SYSTEM IN CONSUMPTION.

1. It is a systemic not a local disease primarily.

2. It is a diseased condition or state due to the presence of a yeast in the blood with its fermentation products.

3. The yeast is introduced into the blood through the alimentary canal from starch and sugar in excess, and in a state of fermentation.

4. The physical micrographical conditions found in the blood of consumptives constitute the peculiar Salisbury morphology of consumptive blood. The main features of which are as follows:—

a). Spores.
b). Spore collects.
c). Mycelial filaments of yeast.
d). Fibrin filaments unusually large and prominent.
e). Enlarged massal white corpuscles. This enlargement proceeding from the white corpuscles being unusually fertile niduses of the vegetation, called entophytal, similar examples of which abound in algæ.
f). Deprivation of the red disks of their coating or neurine, thus rendering them sticky, adhesive, and singularly inclined to aggregate themselves in confused masses. At the same time they lose their color, their clean-cut outlines are diminished in number relatively and absolutely.
g). Thrombi formed of the fibrin filaments. The massal corpuscles. The large spores collect.

5. The vegetation may exist in a latent state.

6. It may be transmitted from parent to child, and thus form the hereditary taint.

Illustrations projected with the lantern:—

1. Spores of yeast from consumptive blood.
2. Spore collect.
3. Mycelial filaments.
4. Fibrin filaments.
5. Fibrin filaments
6. Massal white blood corpuscles.
7. Red disks in consumption, showing their adhesive and singular aggregations.

7. The morphology of the blood is always present some time during one year before organic disease. In other words, the Salisbury plan includes a new physical sign of the pretubercular state. I here show a monograph on this subject alone. In my opinion, if the experience of Dr. Salisbury and myself for the past twenty years should be realized in the practice of all physicians in the United States, at least thirteen thousand lives could

be annually saved by the detection and treatment of the pre-tubercular state alone.

8. Food, then, is the agent of tremendous power that causes consumption.

9. The treatment of the Salisbury plan, in a nutshell, is based on the idea of removing the cause by ridding the blood of the presence of the yeast and its fermentation products by a process of starvation.

10. Tubercle is a secondary product—a result from embolism caused by the minute thrombi of fibrin filaments—of the massal corpuscles, and from the mechanical and chemical effect of the embolism on the nutrition.

11. The breaking down of tissues comes from a necrosis of tissues overloaded with the products of the fermentation. Perhaps one reason why the lungs are so often affected is the presence of air. It is found that the spores of yeast seek air bubbles, probably for respiration purposes.

12. The yeast is also found in the alimentary canal, on the skin in the night sweats, sputa, etc.

13. More than twenty years ago Dr. Salisbury made bread from the yeast found in the diarrhœal dejections of third-stage consumptives. I here present some bread similarly made, under my direction, eighteen months old.

14. The progress of the case is best watched and studied in the morphology of the blood. The spores are diminished, the filaments removed, the enlarged massal white corpuscles are reduced in size to normal proportions; the red disks acquire their normal color, covering, and clean-cut outlines; the fibrin filaments are hardly visible. Thus the red disks dispose themselves in the normal manner the more perfectly, as the cure proceeds. Any deviation in the regime is indicated by the increase of the abnormal morphological elements in the blood. As the blood improves, usually the general symptoms improve, *pari passu.* I have often witnessed, under the treatment, the disappearance of râles of all kinds, night-sweats, emaciation, etc. For more particulars, see the next head—treatment.

15. The Salisbury diagnosis does not exclude ordinary physical explorations; it supplements them. I find that the ordinary idea of this diagnosis in the profession is that sanguinology is like urinology, and all that is necessary is to take specimens of blood, just as we do urine, and base all our diagnosis of tubercle

on the blood examination. The very suggestion of this demonstrates how far the proposer is from having a true idea of the subject; the evidence must be collected with the least possible interval of time between the removal of the blood from its stream to the stage of the microscope. The macroscopic signs are not to be overlooked.

16. There are other diseases in which the normal blood morphology is disturbed and changed. These Dr. Salisbury has pointed out carefully, to wit, syphilis, rheumatism, paresis, carbuncle, boils, typhoid fever, smallpox, vaccinia, erysipelas, ague; indeed, he shows it is possible to find vegetations in what may be called healthy blood sometimes, but not as a rule.

17. The Salisbury plan affirms the possible contagiousness of consumption, by showing that the materies morbi is a cryptogamic vegetable seed or spore, that can be planted or transplanted from one soil to another; body to body, just as horticulturists do their plants, or as in vaccination.

18. It explains the cough, where it is not due to local irritation in the air-passages, such as hyperæmias, ulcers, infiltrations, reflex irritations, to the presence of carbonic acid gas in excess; sometimes it is wonderful how diminishing the yeast vegetation in the system does away with the cough.

19. It explains hemorrhages as the result of local action of the vegetation on the glue tissues, connective fibrous being softened, disintegrated, and broken down by the products of fermentative vegetation.

20. It explains night-sweats as due to the interstitial necrosis of tissues.

21. The emaciation and loss of flesh are only results of disease.

TREATMENT.

The treatment of consumption by the Salisbury plan consists in removing the yeast from the blood and tissues, by starving it out. This is accomplished by excluding the substances on which yeast feeds from the diet; these substances are starch and sugar. Dr. Salisbury has treated over one thousand cases during the past twenty years and more. In general, he states his results,[1] and the following is the full text of the Salisbury plan of treatment:—

[1] Va. Med. Monthly, Sept. 1879, Richmond, Va.

"The chills, fevers, and sweats grow lighter and lighter, and finally cease entirely; the blood-making process goes on rapidly; the bloodvessels fill out; repair of tissues begins and goes steadily on; the eyes brighten; the cough gradually grows less and less; interstitial death, decay, and disintegration of lung tissue cease; the glow of health pervades the entire organism, and step by step the patient (if he perseveres) advances safely and surely toward health, which to reach only requires patience, and the rigid observance of the rules here laid down. To accomplish this, the diet and treatment are to be closely and conscientiously carried out, in all their details, with the soul and body of the patient enlisted in the good cause. Of course it takes time; for nature, after all, does the work, and consequently all the changes must be physiological, and only as rapid as the human machine—when well run—can organize and repair. The physician must know precisely what to do, and do it. He must watch his patient daily, examining excretions, secretions, and blood carefully, and see that every part of the programme is faithfully and honestly carried out.

Any deviation from the right course can be detected at once, by an increase in fermentation, consequent biliousness, heightened color of urine and aggravation of cough, and all the other pathological symptoms. Patients cannot deceive the skilled physician in this field of positive work. If the directions are all rigidly followed, the machine will soon get to running nicely, and continue to do so, till thrown off the track by departures. These departures should be detected and corrected at once, or the patient begins to lose ground. No one need hope to handle consumption successfully simply by change of climate and medicine. It is a disease arising from continued unhealthy alimentation, and must be cured by removing the cause.

I. Drinks.—Drink half a pint of hot water one hour before each meal and on retiring, for the purpose of washing out the slimy, yeasty, and bilious stomach before eating and sleeping. Drink a cup of clear tea, coffee, or beef-tea (the latter free from fat) at each meal. During the interval, between two hours after and one hour before each meal, drink hot water or beef-tea, if thirsty.

II. Food.—*Meats.*—Eat broiled beefsteak, which has been entirely freed from fat and bone. Have it seasoned to taste

with salt, pepper, and butter. For variety, use broiled chicken, broiled game, oysters, roasted in shell or broiled, broiled lamb or mutton (lean), broiled codfish (fresh and salt), broiled and baked fish free from fat, and broiled dried beef, chipped thin and sprinkled over beefsteak. A soft boiled egg may be taken occasionally at breakfast with the meat, if it does not heighten the color of the urine.

Bread.—Bread, toast, boiled rice, cracked wheat or oatmeal mush may be eaten in the proportion of one part (by bulk) to from *four to six parts* of the meat. The bread should be free from sugar and raised with yeast. It may be made from gluten flour, white flour, or Graham flour; corn meal should be avoided.

All things not previously enumerated, and the following articles of food, should not be eaten, viz.: Beans, soups, sweets, pies, cakes, pickles, sauce, preserves, fruits, vegetables, greens, pancakes, fritters, crullers, griddle-cakes, and mush. Vinegar should also be avoided. Use butter, pepper, and salt for seasoning; also use either Worcestershire or Halford sauce, mustard and horseradish with lemon juice on meats if desired. Celery may be moderately used as a relish.

III. Baths.—Take a soap and hot water bath twice a week for cleanliness, after which oil the entire body, rubbing in well. Every night sponge the body and limbs with one quart of hot water, in which put from two to four teaspoonfuls of aqua ammonia; after which rub well and wipe dry. Every morning, sponge off with a little hot water, wiping dry and rubbing thoroughly.

IV. Clothing.—Wear flannel next the skin, and dress comfortably warm. Change all clothing worn during the day on retiring, so that it may be thoroughly aired for the following morning. Keep the clothing sweet and clean, by changing every other day.

V. Exercise.—Ride daily in the open air as much as possible without fatigue. If not able to ride, the body and limbs should be rubbed and pounded all over, for ten minutes morning, noon, and night, by some one who has sufficient strength to do it thoroughly.

VI. Meals.—Meals should be taken at regular intervals, and it is better not to sit down at a table where others are indulging in all kinds of food. Eat alone, or with those only who are on the same kind of diet. After the system gets in good running

order, which is indicated by the urine flowing at the rate of three pints in twenty-four hours, and standing constantly at 1.020 density, the appetite becomes good, and usually more than three meals a day are desired. This desire for food should be gratified by allowing the patient a nice piece of broiled steak, with a cup of clear tea, coffee, hot water, or beef-tea midway between breakfast and dinner, and dinner and supper.

VII. Treatment.—Before each meal the patient should take a small dose of some good tonic. If there is a softened state of the tissues of the lungs, endangering hemorrhage, something like the following would be a good tonic:—

℞. Fluid extract	pyrus malus radice,	f℥iij,
"	witch-hazel,	f℥ijss,
"	cinchona comp.,	f℥ijss,
"	ginger,	f℥ss,
"	yerba santa,	f℥iij,
"	grindelia robusta comp.,	f℥ijss,
"	sundew,	f℥j,
"	water-fennelseed,	f℥j,
"	orange peel,	f℥ss,
Ol. menth. pip.,		gtt. xx,
Ol. wintergreen,		gtt. xij.—M.

S. Take a teaspoonful in water before each meal.

If the disease is complicated with chronic diarrhœa or consumption of the bowels, something like the following would be appropriate:—

℞. Fluid extract	cranesbill,	f℥ijss,
"	ginger,	f℥ss,
"	witch-hazel,	f℥ijss,
"	pyrus malus radice,	f℥iij,
"	ampelopsis,	f℥j,
"	yerba santa,	fʒiijss,
"	orange peel,	f℥ss,
"	winter-green,	f℥ij,
"	cinchona comp.,	f℥ij,
Ol. menth. pip.,		gtt. xv.—M.

S. Take a teaspoonful in water before each meal.

Immediately after each meal should be given either eight grains of pepsin, eight grains of lactopeptine, or eight grains of pansaline. This latter remedy is composed as follows:—

℞. Boudalt's pepsin,	f℥j,
Pancreatine,	fʒiij,
Phloridzine,	fʒiij,
Lactic acid,	fʒij.—M.

To sweeten the stomach and bowels, and also aid in checking diarrhœa, if there is any, give:—

℞. Carbolic acid (pure white crystals), f℈ss,
Aqua, f℥viij,
Ol. menth. pip., gtt. x.—M.
S. Take a teaspoonful in a little water fifteen minutes after each meal.

To assist in making blood or to tone up the enervated nervous system the following is a very good pill:—

℞. Phosphorus, (1-100 gr.)
Strychnine, (1-100 gr.)
Iron, sulph., 1 gr.
S. Take a pill two hours after breakfast or dinner.

To invigorate and to improve the condition of the mucous membranes throughout the digestive tract, and to so tone up the throat and fauces as to prevent taking cold at every slight exposure, take the following:—

℞. Spts. ammonia, aromatic, f℥viij,
Salicin, f℥ss.—M.
S. (Shake well before taking.) Dose. Take from one-half to one teaspoonful in a wineglass of water one hour after each meal.

If there is constipation of the bowels, use the mildest means to stimulate their muscles and glands, so that they will move once every day about breakfast-time, if possible.

The following external application will be found useful:—

℞. Emplastrum belladonnæ.
(Spread with the alcoholic extract.)
S. Apply to chest.

If there is danger of hemorrhage, provide the patient with an atomizer and a weak solution of persulphate of iron (one drachm to eight ounces of water), and instruct him to have the apparatus in readiness, so that, when there are indications of bleeding, he may inhale at once the spray of this mixture. It will check the bleeding in a few minutes.

℞. Salzburg porous plasters, two.
S. Apply one over bowels and one between the shoulders.

If the directions here given are faithfully followed out and persisted in, consumption *in all its stages* becomes a curable disease."

Mark, he does not say he *cures*, but that the disease becomes,

in his experience, amenable to treatment, and, like typhoid fever, *curable.*

I herewith submit a series of seventy cases, which I have observed myself, and which have been treated on the Salisbury plan. They are arranged in three series: First, not arrested; Second, arrested; Third, cured, if any organic disease has been cured. First series, seventeen cases; Second series, twenty-seven; Third series, twenty-six cures.

In conclusion, the writer begs leave to state his desire in relation to this matter. If these histories appear to be valuable as far as the experience of the witnesses goes, would it not be well to advise the institution of some practical experiments on a different scale to see if the experience of the relators is borne out? Practical tests would be far better than any amount of theorizing. If it should be found that the evidence is not sustained, the writer will apologize; but, if they should be sustained, then surely a more munificent gift than anæsthesia has been conferred on the human race, and the name of Salisbury will be cherished like Galen's.

SERIES I.

NOT ARRESTED.

CASE I.—Widow B., aged 43 years, small-sized, thin, anxious, and nervous. Asthmatic complication, old abscesses of the mediastina, diarrhœa, dyspepsia, sleeplessness, severe cough, dulness on percussion, with constant crepitant râles over both upper thirds front. Great dyspnœa at times. Abnormal valvular sounds of the heart. No albumen in urine. Altogether the most distressed and suffering case of consumption I had seen for some time. The effect of the animal diet, baths of mineral acids and quinine was to relieve, in a measure, the night-sweats and abdominal pains. But the appetite turned against the animal food, and it often would be rejected by vomiting. She was obliged, then, to carry out the regimen only partially, particularly as she laid all her bad feelings, distresses, and sickness to her food or medicine, and never to her disease. She suffered also greatly from a prolapsus of the uterus, aggravated by the severe coughing. This case was not relieved by the special treatment recommended. The weakness of mind

and body, induced by the presence of organic disease in the thoracic and abdominal viscera, was too great to be reached by perhaps any treatment. Indeed, just here it may be stated that no pretension is made towards the cure of any but one-third of the cases; but, to insure that third, it is necessary to have the treatment strictly carried out. The present case was one in which there was really no hope, and only adopted as "a drowning man catches at a straw." It is thought best here to give simply the bad and good cases together, and let the reader judge for himself of the value of the data thus derived.

CASE II., the father of Case XXIV., was seen at the same time, sick, and confined to the house with great emaciation, pallor, thinness, cough. There was not so marked a condition of dulness or of crepitant râles as in the son's case. The diet in his case made little, if any, difference, and death ensued in a few weeks. This case belonged to the incurable form and variety. It is only in the interest of the truth that these lines are written. There is no desire to conceal the failure of this treatment, nor to elevate it to a higher position than it really deserves.

CASE III.—Dr. W. F. Stevens, of Stoneham, Mass., died in Feb. 1879, aged 72 years. He was a grand man in his profession, and honored it for half a century. His last illness dated with the summer of 1878. Cough, emaciation, prostration; pain in the lower third, left front, were the most prominent symptoms. He had overworked himself, such were his skill and success, combined with a desire to do the most good he could to his client. His blood was not examined, for some special reasons; but Dr. H. I. Bowditch confirmed the diagnosis of tuberculosis, previously made by his son, Dr. Winthrop F. Stevens, and myself. Though a hopeless case, still, after much talking and urging the Dr. went partially on the Salisbury plan in December, 1878. The effort was marked by an abatement of cough, and the improvement of symptoms; still he "slumped" at the last like the fading of a leaf. It cannot be said that the plan was of no avail in this case, as the physical conditions were improved. But the disease had gone too far, and a bright local light in our profession passed away to an eternal rest.

Case IV.—Lady, about 35 years—advanced stage of disease, which had existed for three years. The symptoms were ameliorated for a time by a rigid adherence to beef-steak diet, and medical treatment addressed to throat, skin, and stomach, but without success, for, rather unexpectedly, she grew rapidly worse, and died. Although the digestion improved, and the diet was relished, still the disease was too far advanced for relief. Resident of New York.

Case V.—An Irishman, aged 40 years, with grave general symptoms, although the local disease was not marked; pursued the diet for a while rather feebly. His case seemed ameliorated, but terminated fatally in a few months. The result was unexpected, as the local trouble was so slightly marked; but I am now inclined to think that, in estimating the vitality in a given disease, it is perhaps best to rely more upon general than upon local signs. And, then, physical signs are sometimes fallacious. Take cases of consumption; they vary from time to time, although becoming progressively worse. I have had clear percussion preceded by dulness; absence of râles which had previously existed; and yet the changes could not be accounted for, except, perhaps, that there was greater weakness in inspiration.

Case VI.—Mrs. ——, Brooklyn, N. Y., advanced tuberculosis. Physical signs of extensive disease throughout both lungs. Great prostration, weakness, and impaired morale. Night-sweats. There was not much response to the effort to get her to try to do anything for herself. She went faintly and irresolutely upon the dietetic regimen heretofore described, but without avail, and died in the course of a few weeks. The case evidently was beyond the reach of any treatment. Still, it is a difficult matter to draw the line, as apparently more unpromising cases have done well, as the sequel will show.

Case VII.—1877, Aug. 28. M. H. S., fisherman, Lanesville; aged 33 years. Father died of phthisis. Mother living. Been sick two months. He states that he took a cold and went out fishing. Was exposed and took more cold. Except two attacks of typhoid fever, was perfectly well before. General appearance bad. Cough is constant and severe. About one teacupful of yellowish white sputa raised daily. No hæmoptysis. No dyspnœa except on going upstairs. Severe pain in shoulders. Ap-

petite poor. Bowels regular. Has lost flesh and strength. Night-sweats copious. Pulse weak. Hands shake badly.

Physical Signs.—Thorax: Dulness on percussion and crackling over right upper third front and lower third back; feeble inspiration, almost flat on percussion; no crackling; but the respiratory murmur was heard underneath. Inspection of the blood revealed spores and spore collects in abundance. Fibrin and mycelial filaments. Red corpuscles adhesive, sticky, irregularly massed, pale in color.

Mr. S. went upon the treatment with quinine. It was his intention to come up from the Cape again, but he was unable to do so, and, despite the means used, he not long after died.

Remarks.—At the time it did not seem to the writer that his case was so hopeless. Still his history teaches that one must not trust too much to first appearances. It is a disadvantage to see a patient only once. It was reported that he faithfully used the diet.

CASE VIII.—1877, Sept. 4. An over-grown and over-worked farmer's boy, aged 19 years; of large stature; had been sick for two months. In consultation with Dr. Harlow, of Woburn, I found him in bed; pulse 110, temperature $102\frac{2}{5}$, fever, peculiar pallor, copious sweating, severe cough, copious sputa, no hæmoptysis, great prostration, hebetude, coated tongue, tympanitic bowels subjectively painful but not sore to the touch, diarrhœa.

The blood showed the red corpuscles to be of a good color and formed in rouleaux, well rounded out and distinct. Spores and mycelial filaments abundant. Collections of micrococcus spores. There were crackling and dulness on percussion over the left upper third front.

Diagnosis.—Acute tuberculosis and typhoid fever. In a few weeks the patient died. The autopsy revealed tubercles throughout upper lobe of left lung. A cavity in the same, which was adherent at one point of its walls to the pleural parietes. It was of small size. Oss of purulent fluid was found in the right pleural cavity. The abdominal cavity presented the signs of well marked and fully developed peritonitis. Plastic lymph was plastered all over the intestines and omenta. No enlarged Brunner's glands. No tuberculous omental lymphatic glands. Evidently the immediate cause of death was the peritonitic inflammation.

Remarks.—The existence of so much peritonitis was not suspected before death. However, the diagnosis of tubercle was confirmed. It is interesting to note the condition of the red corpuscles, which varied from those usual in tuberculosis. The question arises, How far did the pleuritic and peritonitic inflammation combine to produce this effect? Our object is simply historical, and to excite inquiry.

Case IX.—Acute tuberculosis in the puerperal state. Mrs. C., Winchester, Mass.; a pale, thin, medium-sized woman, aged about 34 years; came of a consumptive family. In Aug. 1877, she was found in bed. One child a week old. Dr. Wight consulted. Seven days before delivery she had a severe and copious hemoptysis. Previous health bad. Six days after delivery she had another attack of profuse hæmoptysis. The expectorated blood was scarlet-red and thin. At the time of our visit some dark-colored remains of the hemorrhage were being coughed up. Pulse 120; respiration quickened. Systemic heat persistent, marked, and general. The prostration was great. The patient referred to the left upper third front of chest as the source of the bleeding. Here there was diminished resonance on percussion, also coarse and fine crackling râles. These were also heard over the back. The blood presented numerous spores and fibrin filaments. The red corpuscles were massed together, but of a good color, and well rounded out. (Was this due to the puerperal state?) Expectant medicine advised. Alcohol on flannel to be kept on chest in front. Sulphuric acid baths. Strict diet. The surroundings were bad; the house in which she lived was dark, damp, and covered over with apple-trees; and her circumstances were limited.

Oct. 24, 1877. Dr. W. writes that Mrs. Crawford adhered to the strict diet with comparative fidelity, but went on steadily from bad to worse, and died in about a fortnight afterwards. In his opinion, the gestation and parturition (primiparal state) accelerated the progress of the case.

Remarks.—The writer cannot help saying that, had he been able to care for the patient in a sanitarium, where special means were provided to carry out the treatment, the fatal result would have been retarded longer, inasmuch as there was not extensive local disease.

Case X.—April 31, 1877, Miss Dolan, 17 years of age, presented herself with her father for examination. She was undersized, pale, thin, feeble, downcast. She complained of cough, copious expectoration, loss of flesh and strength, amenorrhœa, anorexia, and was running down rapidly. She presented physisical signs of disease in her lungs and in her blood that were marked well enough for a diagnosis of tubercle. But the general impression was conveyed by her exploration, that she was not so sick as her father was, and had a much better chance for recovery than he, under the proposed treatment. It came out that the family diet had mainly been flour, potatoes, and tea, with comparatively little animal food. She submitted to the same general treatment, although his demurring had to be removed by the statements that it was cheaper "to pay the butcher than the undertaker," and that the animal diet would cost but little, if any, more than the present one, because a smaller quantity was needed. In general, she followed out the treatment very well, with a marked apparent improvement, so that, while her father was confined to bed with hydro-pneumothorax, she was about the house and out of doors, comfortable; and it was supposed she would do well. Nevertheless, she died from her complaint in October, 1877. It is well understood that she varied from her diet. It is a very hard thing to make people change the old habits of eating, especially in young people of foreign races. Moreover, the amount of disease was limited at first. This element is not always a reliable factor for favorable prognosis.

Case XI., 1877, Nov. 3. Dr. Fuller, aged 37 years, resides near Concord, N. H. He is a man of size, weighing in health 287 pounds. He complains of weakness, and a desire to gape. His difficulties, according to his own story, began in June last with a rattling in his throat, and an irritation that caused cough, and the expectoration of a little tough phlegm. He had been coughing night and day, without rest, the sputa being copious and purulent; no blood. About five weeks ago he had chills, and complained of the impossibility of getting warm enough to be comfortable. Present dyspnœa has existed for a month past. Has lost seventy pounds of weight. Now he has afternoon fever, with headache. For six weeks his voice has been hoarse and gruff; sleep quiet, except for the rattling noise

in throat. At one time he could not sleep at all, from the disturbance caused by the noise. No dysphagia; no choking; no palpitation; no œdema of legs; no pain, except a slight catch in right chest; appetite poor; digestion good; no night-sweats. Locates trouble at the upper part of the sternum.

Physical Signs.—Chest: Dulness and crackling over right upper third front. Less dulness, but marked crackling râles over right back. Heart's sounds feeble, but normal. Dulness area of heart not increased. *Throat:* Inflamed throughout. *Blood:* Fibrin and mycelial filaments marked, spores, spore collects, and *débris.*

Diagnosis.—Tubercle.

Treatment.—Advised his physician, the venerable Dr. Haines of Concord, N. H., to touch the throat every other day with liquor ferri persulphatis and glycerine, equal parts; strict diet, nascent chloride of ammonia, acid baths. Also to relinquish the practice of his profession, as far as it related to night work and exposure.

Dec. 13. Seen at Concord, N. H. Been pretty sick; has run down under the treatment very much. Has been so weakened as to fall out of his chair; cough and some dyspnœa continue; flesh reduced; rheumatism in left knee-joint; irritation in throat considerable, though the applications have been made with great benefit. Sleeps from 6 P. M. to 10 A. M., and awakes refreshed. Night-sweats diminished. Has used salt instead of acid baths. The nascent chloride of ammonium did not agree with him. Takes 6–8 grains of the sulphate of quinine daily. Tried living on three quarts of milk daily, but did not find sufficient support, and was obliged to resume his stimulant, namely, New England rum, of which he imbibed a large quantity daily.

Chest.—Right upper third front—dulness on percussion. Soft and crackling râles. Elsewhere normal.

Blood.—Fibrin and mycelial filaments marked. Spores and collects marked. Red corpuscles massed irregularly. White corpuscles enlarged.

Diagnosis.—Confirmed. Disease increasing. General appearance, however, improved. Learned that he seemed better every other day—that whereas he was in the habit of raising Oij purulent sputa, now he raises almost none—that he has had epilepsy, and his weight is now 205 pounds. Advised salicylic acid, nitro-muriatic acid baths, strict diet.

Dec. 24. Thinks he gains. Sweats much less.

1878, *Jan.* 1. Came to Boston. Finding his uvula much relaxed and elongated and tickling his throat, it was removed by a wire écraseur. This method seemed good and expeditious at first. But it was ascertained that the wire drew off the mucous membrane from the free edges of the soft palate, and shreds were left hanging down on either side. Patient's general appearance bad. Preferred to lie abed, as he suffered from hectic, with loss of flesh and strength. 14th, went home.

22*d.* Since return has coughed and raised incessantly. No sleep. Takes rum very freely. Carbolic acid spray faithfully inhaled. Diet adhered to. On the day he returned home I projected some of his blood upon a screen by helio-microscopy, and the abundant spores were in very active motion in the serum.

28*th.* No better. Now lives on cream and rum. Died soon after.

Remarks.—This was a case with small amount of local disease at first. The complaint of growing weak under the diet is quite common, but the feeling usually soon passes off with time and a larger quantity of food. How far an error was committed by allowing the free use of rum I don't know. It was not supposed that alcohol, being a product of fermentation, could promote the growth of the yeast. By analogy we should expect acetic acid from alcohol in the blood; whether this is so or not I cannot tell. I rather regret Dr. Fuller was not plied more with food than alcohol; but he loathed the food and craved the alcohol, though there were no signs of intoxication that I could detect. Anyhow his case was not arrested.

Case XII.—Mrs. Little, in July, 1873, who resided in the town meadow of Woburn, applied for advice in relation to a chronic cough, copious muco-purulent expectoration, and reduction in flesh and strength. She was pale and waxy in look. Her chest presented physical signs of tuberculous disease in its early stages. The blood also confirmed this. The throat was troublesome and inflamed. She was put upon the diet, with topical treatment and general tonics. The course was but poorly followed out; her situation in life rendered it impossible. She retrograded and died in a few months, although she had naturally a good constitution. Could she have had good care and provisions, the

issue might have been different, as the systemic disease had made but little local progress in the lungs. Judging from this case and others, the amount of local disease is not a guide to prognosis. Some constitutions seem to offer a better nucleus or soil for the development of tubercle than others.

CASE XIII.—In July, 1874, a daughter of Case XII., eighteen years of age, contracted a severe cold from living in the same town meadow damp location.

She presented dulness on percussion, with crackling at the upper part of one lung. Her cough was not severe, but chronic and moist, though the expectoration was scanty.

The blood examination revealed spores, spore collects, and fibrin filaments. For some reason unknown she did not follow out the course of alimentation that excluded carbo-hydrates, and did not come under my notice again personally. Her death from consumption was noted in the course of six months. It is simply a case for diagnosis and partial treatment. Although the mother died from the same complaint, I am inclined to think it was not hereditary, the remarkable dampness of the residence being an adequate cause.

CASE XIV.—Mrs. Noonan, Irish, aged 40 years, mother of several grown-up children, in the fall of 1876 was interviewed in relation to a chronic cough, copious expectoration, hæmoptysis, loss of flesh, night-sweats, etc. She had a pallid, anxious look, and appeared thoroughly worried out.

Her chest presented crackling and sonorous râles over the upper thirds in front, and dulness on percussion, etc.

Blood showed well-marked spores, collects, fibrin, and mycelial filaments.

She had taken much medicine. Was advised to use the acid baths and animal food diet strictly, with a simple tonic of quinine and iron. She undertook the diet. It was not, however, carried out, and, as might have been expected, she did not derive any benefit, apparently, from this partial course. Afterwards died.

CASE XV.—July, 1873, Mrs. C. E. Whiting, aged 55 years—aphonic. Been sick for two years or more. Cough troublesome; sputa thick and copious; night-sweats copious; flesh and

strength impaired and diminished; invalided. A widow, in comfortable circumstances. Naturally spare, tall, symmetrical, and bilious constitution.

Physical Exploration; Inspection.—*Larynx* generally infiltrated, thickened, and inflamed. Vocal cords free from new growths, but swollen, ash-colored, and stiff; hence the aphonia.

The *blood* presented the usual morphology of consumption in a plain, unmistakable manner.

The *chest* was emaciated, flattened antero-posteriorly. Coarse and fine râles, with cavernous respiration at apices on auscultation. Dulness, etc., on percussion. Pronounced to be in the third stage. Little anticipation of benefit was expected from strict diet, acid baths, tonics, and local applications to the vocal cords. Symptoms relieved. Death in the course of nine months.

CASE XVI.—Mr. James Chandler, who lived on Salem St., near Woburn watering station, B. & L. R. R., in July, 1875; had moved from Cambridgeport, in order to get into the country air and surroundings. He was a marble worker by profession, and ranked as a superior craftsman. He attributed his disease to the injurious effects of inhaling the dust of the marble yard. He had been ill for some time, and took a desponding and hopeless view of his case. He complained most of severe trouble with his throat, difficulty of speech and swallowing, but not of breathing.

The laryngoscope revealed that the vocal cords were thickened and ulcerated. The arytenoid cartilages were enlarged. There were not very extensive signs of physical disease at the apices of both tissues, but they were well marked.

The blood was found to contain a considerable amount of spores, collects, and fibrin filaments. He adopted the strict diet, nitric acid baths, and liquor ferri persulphatis and glycerine, equal parts, to the larynx. But there was no improvement in his case. It went on, until he gave up the treatment in less than a month from discouragement. His wife was an invalid, in bed, and he could not get any assistance from her. No doubt this added to his demoralization of purpose and self-denial; for it is a matter of cross-bearing to become radically changed in relation to diet habits; so much so, that I think the question of diet treatment is solely one of mental philosophy. I have seen a good moral and resolute energy work wonders in desperate

cases, where less energetic and persevering means would allow a promising case go to ruin, simply for the want of an invincible determination and a resolute will.

It is the duty of the attendant to encourage and assist in every way to enable the victim to conquer his own inclinations, preferences, tastes, and predispositions which militate against a rigid diet system.

CASE XVII.—Mrs. A. R., a very tall, flat-chested woman, of middle age, and the mother of three great grown-up sons, was a hard working, patient, faithful, and capable farmer's housewife. She had (1874) been in feeble health for many years, and regarded as consumptive. She had experienced several severe attacks of hæmoptysis; had chronic cough, and pretty copious expectoration. Nevertheless, with rare fortitude she had managed to keep her place at the head of her family, performing its household work, mostly without assistance. In the fall of 1873 she contracted a fresh cold, which was followed by febrile symptoms and severe sickness. Decided marks of the breaking down of the pulmonary tissues were manifest when the chest was examined. The blood was found to contain all the morphological evidence of the tubercular state. She went partially upon the diet, and took a good deal of medicine, which the urgency of her symptoms called for. But there was little or no improvement in the case. Her heart was troubled with palpitation; she had diarrhœa, jactitation, restlessness, hectic and progressive emaciation. Death ensued before the spring came on.

Remarks.—This is one of those cases wherein the powers of life resisted long the onsets of the disease. She excluded animal food to a good degree from her diet, and managed to eke out a half existence battling for life. The hemorrhages from the lungs were the most prominent symptoms of trouble. Under the circumstances, and also in the light of the history of the cases to follow, it may be inferred that had a different regimen been pursued in one whose vital powers proved to be so resistant, perhaps a different history might have been recorded here.

SERIES II.

ARRESTS—TEMPORARY.

In this series we class those cases that gave much promise of permanent benefit, but which did not last. Cases in which there was improvement in several respects, which usually was very encouraging to the subjects themselves, but proved illusory. Cases, however, which go to show that the Salisbury plan did avail to hold back for a time the tide of death, did remove, in a measure, the morphological elements of disease from the blood, in doing so did cause systemic improvement too closely related not to be regarded in the light of cause and effect. Cases that one could have hoped might have been treated earlier, in other words, in the pretubercular stage, when the chances of cure are more sure and promising.

CASE XVIII.—Arrested for twelve years. Mr. J. T., Jr., twelve years previous to his death was regarded to be in consumption for the following reasons: Severe pulmonary hemorrhage, dulness on percussion and crackling over left upper third front, emaciation, cough, and night-sweats. He was sick a long while. Cod-liver oil was the standard remedy, and was very distasteful to him. Moreover, being one of those persons who are governed by the æsthetics of taste rather than by the scientific principles of medicine, he absolutely refused to take the nauseous oils. "Do you like butter?" "I do," was replied. "Eat it then as much as you wish," was the injunction. This was followed up so that he consumed one and a half pound daily. Under this diet, or rather medicine, he improved very much, and was able to perform the duties of clerk in a hide house; though his health was not robust, still he generally looked well. He survived in active life for about twelve years, when his earthly existence was terminated by a profuse nocturnal hemorrhage from the lungs, during which he died. An autopsy revealed the signs of healed cavities in the apex of the left lung, while a very limited amount of active disease lay upon the right apex of the right lung. Elsewhere normal. It was and is now my opinion that the butter (animal food) was no small or uninfluential agent in arresting and delaying this disease for so long a time.

Remarks.—The benefit of cod-liver oil resides in its being free from carbo-hydrates (in my opinion). It is assimilable, not fer-

mentable (in the yeast sense of the term). The alleged good effects can be produced better with beef or butter, as they are more palatable.

The small amount of local disease found after death in this case is remarkable, but for the hemorrhage drowning him, as it were (for its copiousness must have filled the bronchial tubes), he might have had a chance for a longer run of the disease. This case affords an additional instance where the amount of invaded tissue bears no proportion to length of time or gravity of the disease. A small artery was probably ruptured by local perforation, and hence the sudden demise. Perhaps this case might be termed a cure with modifications.

Case XIX.—A young unmarried woman lived in a shaded house in Boston. About thirty years of age. Gentlewoman. She complained of cough and sore or rather irritable throat. She had lost flesh and strength. Looked as if etiolated. The blood was in the pretubercular state. There were no physical chest signs of a decided character that confirmed the diagnosis. Her throat was touched with iron, and the Salisbury plan was adopted. But she ran down and died within six months.

Remarks.—In justice to the plan and myself it should be said that the plan was not followed out, and my attentions were dismissed quite early in this case. In the light of the succeeding histories had she been faithful, I have every reason to believe that her chances of recovery would have been more than one out of three.

Case XX.—Mrs. B., 24 years of age. A thin, pale, sprightly-looking lady; when seen, far advanced in pregnancy with her first child. She had cough, dulness on percussion and crackling over the right upper third front. She had lost flesh and strength. Had night-sweats, and an ethereal look that often pertains to chronic disease. The case was put on partial diet until delivery was accomplished without trouble. After delivery she had what her attending physician called pelvic cellulitis. This was attended with prostration and a severe pain in the right side. She was kept in bed for six or eight weeks. The writer saw her in consultation. There was no increase in the physical signs of trouble in the lungs. In the pelvis the uterus was found retroverted partially. Behind the uterus

there was an obovoid body, large as a walnut, tender and sensitive, when touched it sent a thrill through the body. The writer regarded it as a prolapsed ovary associated with retroversion. The consulter disagreed. The pain persisting notwithstanding the medication resorted to, the consultant's opinion was adopted. On restoring the uterus to its normal site with a sound the obovoid body rose beyond reach, the pain in the chest disappeared, and did not return till after a jolting ride in a horse-car. The adoption of similar means was followed by similar relief. These apparently outside facts are not irrelevant to the treatment of consumption, as they demonstrate that in one case, at least, thoracic pain had a pelvic origin. I have seen a case of similar pain caused by an ulcer behind the soft palate. This was shown by the aggravation of the thoracic pain when the ulcer was touched, and the subsidence of pain when the ulcer was healed. One needs to thoroughly understand the doctrine of reflex irritation even in practice apparently confined to the chest. In order to properly treat some cases broad and systematic views should be entertained. Pain is a symptom of trouble somewhere. It is a flag of distress hung out as a warning or result of lesion. Those of us who can ascertain the larger number of causative lesions are generally those who can give the most relief.

Mrs. B. then commenced the use of quinine, acid baths to the skin, and the strict diet, *vide* Appendix. She has gone on improving; her night-sweats left; cough hardly perceptible; physical signs of trouble almost disappeared, only a slight crackling apparent occasionally. The signs in the blood indicating disease have diminished. In fact, photographs of Mrs. B.'s blood show how much diminution of spores, filaments, and enlarged corpuscles has taken place, when compared with photographs that show the blood of a case like hers when first dealt with to improve the condition of the blood. A member of her family said, "She don't need a doctor now [I called to see her during her absence], I never saw her so well since I knew her." Which is a mode of expressing the opinion of an interested outsider, who was rather sceptical as to the utility of the means proposed for relief in a case so apparently hopeless.

Case XXI.—Mr. W., aged 60 in 1874, had been consumptive for two years. His occupation was that of an overseer of an

umber-paint mill. He had with a cough marks of increasing debility, as loss of flesh, animation, and courage. There were marked dulness of percussion, crepitant and sonorous râles over the upper part of both lungs. The blood also presented fibrin filaments marked—spores, collections of spores, but not many filaments. He has for two years since 1874 lived upon animal food diet. His wife has faithfully prepared the choicest meats for him, and what is more, has encouraged him in pursuing the uncommon diet. The case was rather unpromising at first, owing to its long standing and extent of the tubercle infiltration. He is, however (1876), comparatively well. Cough is hardly perceptible. The physical signs are still to be detected, but with less marked characteristics. He attends to his business as usual. Says he expected to die, in which expectation the community shared. The blood shows great diminution in the foreign admixtures. 1879, still living, but very feeble. In October he died.

Case XXII.—A man 27 years of age; of rather feeble intellect; pale, thin face; stooping posture; flattened chest; suffered from severe cough, which lasted all night; from night-sweats and debility. This was in February, 1876. He had been sick since last August, and had given up work for the past three months. He was confined to bed, and had received the services of a regular physician with no relief. He coughed and raised all night so incessantly that he could not sleep. The stomach rejected food; he had gastric distress and colic pains. From a boy he had suffered from constipation, and stomachic weakness and distress. His chief complaint at the time of seeing him was the loss of sleep which opiates failed to give from his idiosyncrasies. It was proposed to see what diet should do, and the effort was seconded by all parties concerned. No medicine was given. In three nights, or rather on the third night after its adoption, *he coughed none and slept all night* quietly and refreshingly. The cough began to diminish immediately after he ceased to use the carbo-hydrate and fermentative food. Certainly animal food in his case proved to be the *best cough medicine*. The expectoration diminished in quantity; the appetite improved. Morson's chlorodyne satisfactorily relieved the colic. The dyspeptic symptoms became less than ever before. With

varying progress there was a continual marked improvement. It became so inspiring that he thought he was stronger than he really was. At intervals he resumed work at his trade of plumber, appearing to the casual observer as if he was only a little under the weather. His cough was hardly noticeable; he ate largely, and gained in flesh and physique. On one occasion, during the spring, he foolishly allowed himself to undertake the removal of a $\frac{3}{4}$-inch elbow from the service-pipe of the water-main while the pressure was on. He was obliged to break it, and the water drenched him completely through before he could control it. It was a foolish thing for any one to do, much less a man sick with phthisis. As might be supposed, he contracted a severe cold which developed a latent tuberculous pneumonitis. His troubles all returned; he was prostrated in bed; his cough began again; yet he adhered to the strict diet, and gradually became better, though never regaining his condition before the wetting. There was dulness on percussion, with sonorous and crackling râles in the apices of both lungs. The blood was very characteristic. Photographs (see Figs. 1–6) were taken from this case about this time. His pulmonic disease gave him no trouble with cough or raising, but a severe pain arose in the rectum unconnected with defecation. Probably an internal ulcer. Suppositories of opium relieved this greatly. The blood, which had been in a measure cleared up of spore collects, fibrin, and mycelial filaments, now showed them in considerable numbers, but not so extensive as at first, showing the firm hold of the disease. The wonder is, that death did not immediately follow the exposure, and that there was any amelioration or improvement whatever.

Remarks.—Here the amount of disease bore no relation to the progress. Who could expect a man confined to bed, coughing incessantly, and suffering with weakness, emaciation and night-sweats to be relieved, except by death or opium? Had I administered to him any drugs, and the exhibition was followed by a cessation of cough, so that on the third night of administration he *slept all night*, or that he was able to go out, troubled but little with his cough, feeling strong, well, would it not be safe to say that in this case at least the drugs had done good? Yet *it was done* by animal food, and why should not *animal food* have the credit?

Case XXIII.—Miss C., aged 22, residence Cape Cod. Seen July, 1875, amenorrhœa, cardiac trouble, dulness on percussion in upper part of both lungs, expiratory râles in same location.

Blood was full of evidence of disease, as shown by the enlarged white corpuscles, the spores, and filaments. She had been under the hypophosphites of lime and soda. She was put upon the strict diet and mineral acid baths, and was removed to New Hampshire. She was thin in flesh, unable to walk an eighth of a mile from prostration under the necessary effort. For the next three months she was surrounded by encouraging circumstances, and although she was not herself thoroughly convinced of the utility of the measures now proposed, still her friends were, and by means of their influence she adhered closely to diet and baths. Immediately there was an improvement in the cough, in flesh, and strength, which continued. She walked two miles readily. She returned home for a visit in November. Here she abandoned her diet, ate everything she liked, and took medicines. She remained at home four weeks. She ran rapidly down, lingering till she felt "she could not live two days." Returning to New Hampshire she improved but little. Remained here till April, 1876, when being very much worse she returned home to die. Though now (August, 1876) living, she is in a low condition.

Remarks.—Comparing this case with Case XXI. a difference is seen in the mental surroundings. Instead of fully realizing the importance of the course indicated, or rather fully comprehending the importance of self-denial in carrying out the ideas of her medical adviser, as the parties in Case XXI. did, she only got a half hold and a feeble grasp. Her home influences were also not encouraging, so that it is not strange to hear that the regimen was abandoned. It is to be regretted, because such cases tend to throw discredit upon the treatment. It is better for the physician to insist that, unless there is a full surrender of the mind and body of all concerned to the rules of diet laid down—*it* is useless for the patient to undertake it, except as a placebo or diversion. Indeed, the great duty of the physician in these cases after the start is to watch intercurrent symptoms, and enforce by personal influence a rigid adherence to the diet. Should the appetite rebel too strongly occasional yieldings may be tolerated, only to renew afterwards the regimen with more vigor.

She died in 1878.

Case XXIV.—A youth, aged 21, in August, 1874, presented the physical signs of diminished resonance on percussion, coarse and fine expiratory râles, increased vocal resonance in the upper part of both lungs. He had night-sweats, loss of appetite, flesh and strength; continuous harassing cough, with copious expectoration, pallid looks, with every expectation of speedy dissolution. Under the animal food diet, acid baths, and fresh air, his cough diminished so as to be hardly perceptible. The night-sweats ceased. The physical signs of dulness on percussion and crepitant râles almost disappeared. He gained flesh and strength, did sundry hard work, and resumed his employment in a shoe shop. The animal food was very repulsive to him, and it was only by much urging and coaxing that he continued. After a while he grew indifferent; as might be expected, the symptoms re-manifested themselves, and death ensued about January, 1876. Now, here was a change wrought by simple means, and maintained as long as those means were followed up. This young man had been living, before his sickness, on flour bread almost exclusively. A modification of the diet wrought changes which would be considered remarkable, had they occurred under medicine alone. If remedies, called cough-drops, had been administered with the same result as followed the use of the diet, it would have been regarded as a wonderful medicine. So, if animal food proves to be cough-drops, iron and strychnia in consumption, a great point must be gained in the management of disease.

This case brings out one great difficulty that is met in almost every instance where a patient is put upon animal food. There is a natural repugnance to any *one* form of diet, continued all the time. But when the prescribed diet crosses the track of the ordinary diet of the household, it is difficult for the patient to find that encouragement to deny his appetite, and adhere to his course which his flagging zest demands. It is hard to alter the diet list of a modern household. When it is done, not all will be converted over to it, and are as likely to exert an influence to draw away the patient from his prescribed course as to abet him in it. We are creatures of circumstances. It is easy to do as others do. The consumptive, weighed down with diseased tissues and blood, is prone to be despondent, but ready to seize on the slightest encouragement. So that, when a wife, for instance, takes in fully the *idea* of nutrition

on animal food, and sets herself resolutely to aid and abet her husband in strictly following out the list—the beneficial results, if any, are more sure to be realized. For these reasons, the writer has thought there might be established a sanitarium, for the purpose of affording the required diet to all its inmates. In this case, the surroundings would be all in the direction of the treatment. The very atmosphere would be one of encouragement, and a psychological principle of firmness be so firmly established that the aversion to the food would be better overcome.

In every case, before commencing the treatment, it is best to lay before the patient just what is required, and the difficulty in carrying it out. When it is fully understood and agreed to by all concerned, the difficulties vanish. When it becomes an old story they reappear, and only by a firm will and occasional kind encouragement, will they readily vanish.

CASE XXV.—Mr. B., aged 65, in August, 1873, was in great alarm about a recent hemorrhage from the lungs. It was of a florid color, and copious There was cough, paleness, loss of flesh and strength, considerable expectoration, and the cardiac sounds were abnormal. There was dulness on percussion, expiratory crackling over the left upper third front, night-sweats, and loss of appetite. The microscope revealed signs of disease in the blood. Moping spiritlessly about, he acted, if he did not speak, his sentiments of the grave character of his disease. Exclusive diet of animal food, change of air, local medication, with tonics, in the course of one year wrought such a change, that he was enabled to resume his business, and had retained his health, in a comparatively fair condition, up to the time of writing, 1878. The physical signs of lung lesion improved. The cardiac trouble remained at last accounts. For a person who was so rapidly running down, his is a noteworthy arrest. If it had happened in rheumatism, or severe chronic bronchitis, it would have been regarded as a good, tolerable cure. September, 1878, he died, with cardiac symptoms.

CASE XXVI.—Mr. G. C. Whittemore, aged 50 years, sick a year, though never with robust health, was pale, emaciated, coughing hard, night-sweats, chronic dyspepsia for twenty-five years, no appetite for any food, great aggravation of the gastric

troubles. In the left upper third of chest were cavernous respirations and amphoric tinkling, elsewhere crackling and diminished respiration.

The blood was loaded with the morphological elements of the tuberculous taint.

With some persuasion he was induced to try the diet treatment and the baths. The effect was to revive his appetite most especially for the forbidden articles of food. The cough immediately became better. The expectoration diminished to a trifling amount. The nutrition of the system improved with the march of the diet system. But the irresistible desire for the tabooed articles, aided by the assurances of well-meaning but ill-informed friends, caused him to relinquish his restrictions and go to eating anything he wanted, and he died in the course of two months. The bad symptoms recurred with the resumption of the carbo-hydrates. It was like feeding a flame with oil.

Case XXVII.—In October, 1874, Mrs. John Sheehan, a woman with a very young child, that especially cried by night and kept its mother awake, was very pale and thin, coughing severely and raising largely. There was diminished resonance on percussion and crackling throughout the upper third of right lung. She adopted the diet and acid baths. In four months' time the cough was very slight. The physical signs diminished. Her softened lung tissue dried up.

Her appearance improved so much that a casual observer would have called her well. All the time she suckled her infant.

Owing to the hard times she was obliged to relinquish her diet, and would not accept it as a gift. Immediately she began to fail and died in the course of six months. The improvement in health kept pace exactly with the imposed diet. When she ate bread the cough returned. The expectorations were copious. The night-sweats reappeared. This shows markedly the relation of animal food to consumption. It is well worth knowing, for if these things "are done in the green tree what may not be done in the dry?" If tubercular disease may be stayed in its progress by diet, why may not diet be employed as a prophylactic, or why may not the tuberculous taint be eradicated or made less prevalent by the general adoption of animal in preference to farinaceous food, which is so largely used by civilized

nations? The immunity of the Esquimaux, alluded to by Dr. Kane, from consumption may in this view be attributed to the fact that they are exclusively animal food eaters. The data required to settle this important matter must come from a large number of observations.

CASE XXVIII.—Mr. J. F. D., paralytic, W. Falmouth, Mass., aged about thirty years, school teacher. Advanced tuberculosis, August, 1876, as shown by distorted chest, severe cough, profuse hæmoptyses, dulness on percussion, crackling, sonorous, and cavernous râles in both lungs. Consumptive blood morphology marked. He was regarded as rapidly running down, and the writer thought it almost useless to attempt any means of treatment for him. Still the heroic and brave fellow clung to life as long as possible, and being a sensible man and intelligent he took in the idea with great zeal and energy. His night-sweats were checked very soon. He improved in his eating and got out somewhat. November 5th, 1876, his wife wrote: "Last Monday weighed ninety-one pounds, gaining twenty-six pounds in a little more than six weeks," to wit, from sixty-five pounds to ninety-one, or a gain of forty per cent. on the weight of a few weeks before.

These figures show what a skeleton the man was, and how wonderful it was that he should put on flesh thus. It is the most remarkable increase of weight in phthisis I ever knew.

1877, *July* 15*th*. Has now been on the diet treatment for more than one year, though not strictly carrying it out. During the winter he had pneumonitis and almost died from hæmoptyses, but none of large amount. A year ago they were alarming in frequency and severity. Thinks the beef increased the hemorrhagic diathesis. Compared with July, 1876, he looks and feels better and is very courageous. Lately he returned from a visit to Cotuit, on the other side of the Cape. There he had felt the east winds, took a severe cold, coughed considerably, and felt very miserable. He found the air at West Falmouth much better, as it is sheltered from the east winds. The blood certainly showed less morphological elements of the disease. Complained of general weakness in limbs.

Aug. 6*th*. Cough less. Ordered the acid baths, which had been neglected. His wife nobly sustains him *thoroughly* in his

dietary, and her conduct is one great reason of his being kept alive.

19*th*. Coughs from throat irritation. Ordered vaseline. Blood appears well. Coarse and sonorous râles in lungs.

25*th*. Blood abundantly supplied with fibrin filaments, mycelial filaments, spores, and spore collects. Found he had been eating sour apples, which introduced too much carbo-hydrate, and hence aggravated this disease. Coughing more and sweats through the day. Ordered STRICT DIET.

Sept. 16*th*. Not so well. Physical signs of trouble in right lung, where it was not before. Heart troubles him no more. He ran down from this time, and died in November, 1877.

Remarks.—I feel I owe a debt of gratitude to this heroic patient for demonstrating what diet can do in a hopeless case. The disease was certainly, in my opinion, held back one year from its fatal termination. The increase of forty per cent. in weight, in six weeks, was remarkable, and the continuance of comparatively comfortable health, so long as the appetite held good on the diet. If these things are done in the green tree, what may not be done in the dry?

What a future there is to our race if they could be treated in the pretubercular stage!

CASE XXIX.—Mrs. H., 33 years of age; married nine years; one child. Mother died of phthisis in 1864. Mrs. H., except a uterine trouble, has been quite well until she contracted a severe cold, in August, 1876. At that time she resided in Boston Highlands, in a house which was provided with a large rain-water cemented cistern in the cellar. She said there was a damp and musty odor in the house, and attributed her complaint in part to the dampness that ensued from the evaporation of such a large quantity of water in the cellar. She is probably right in this matter. If the present researches tend to prove anything, they certainly show that phthisis is a cryptogamic disease; a blight like the pear blight, that Dr. S. pointed out in 1852 as being caused by a fungous growth, found at first in the fluids and tissues of the tree, before the blight is developed in the leaves and solid substance of the tissues of the tree. So it is possible that Mrs. H. inhaled the germs of disease in the damp and musty air of her house, and the present disease penetrated her system through her lungs. At any rate, she states

she never took such a severe cold, and has never felt as if she had got over it. The cough was the chief cause of complaint. She took cod-liver oil and whiskey all through the winter. Removed to Stoneham, in September, 1876, and kept boarders all through the summer. She has lost flesh and strength. Cough troubling, and sputa copious. No hæmoptysis.

On percussion, the right upper third front presented some dulness. On auscultation, crackling and expiratory râles; on palpation, a vocal fremitus. Heart normal. *Blood inspection* revealed fibrin and mycelial filaments, collections of spores, spores aggregated. Tonsils enlarged; throat covered with whitish secretion; larynx inflamed. Cough very hard—probably caused in a measure by throat ailment.

Ordered strict diet, acid baths, quinine, persulphate of iron gargle, vaseline.

Sept. 21st. Throat appears better. Patient improved. Gargles with iron. Blood showed markedly mycelial filaments, long, curling, and twisted. Fibrin filaments not so marked.

Oct. 5th. Appetite improved, so that she is really hungry. Sleeps well. This case went on so that the patient called herself well, and she passed from under my care. Still, not carrying out the strict treatment, as might be expected, she relapsed, and, trusting herself to homœopathy, died not many months after. I have not the least doubt had she persevered, she might have been living to-day.

Case XXX.—Miss C. H., September 28, 1877, 17 years of age, small, and not well developed, pale and thin, weight eighty pounds, complained of severe cough, some mucus sputa, of hæmoptysis once or twice, of loss of flesh and strength, of being so feeble as not to be able to walk about but little, of night-sweats, not constant, of poor appetite, of looseness of the bowels, of amenorrhœa three months, of catarrh, and of pain in her sides. Consumption hereditary. She had been treated actively with iron, quinine, malt extract, etc., but with no improvement in health.

Physical Signs; Inspection.—Throat reddened and inflamed; *Chest* narrow and thin; *Blood*, well marked fibrin and mycelial filaments; spores and spore collects; enlarged white blood corpuscles. Percussion and auscultation revealed not much abnormal with the lungs and heart. Ordered nitric acid baths, quinine, and strict diet.

Oct. 23d. Reported improving generally, but cough was no better.

30th. Found it hard work to eat the diet at first; now likes it, but finds it difficult to eat enough to satisfy. No gain in flesh; coughs more and raises more; dyspnœa on exertion better; menses have not appeared.

Before she began on the diet her appetite was poor, ever since it has been good. Takes Oij milk daily; eats sardines, lemons, cranberries. The blood presented fibrin and mycelial filaments; red corpuscles well defined and distinct; white corpuscles very much too numerous.

P. S. Slight dulness over right upper third front of the chest. Dulness very marked over the region of the spleen and over a larger area than normal. From the increased quantity of the white blood corpuscles and the abnormal dulness, it was inferred that there was a splenic enlargement. Touched the throat with the liq. ferri persulphatis. Continued the strict diet, baths, quinine. Ordered in addition, belladonna plaster to the pericardium, and chloride of ammonia pills, 3 grains each, thrice daily.

November. Received a letter from her mother, stating that the cough was relieved for a time after the application, but had returned, and that the journey on the occasion of her last visit fatigued her very much.

Remarks.—In Dr. Salisbury's admirable paper on the Spleen,[1] he demonstrates the great site of the origin of the white blood corpuscles to be the spleen. He also points out the way in which the evidence of splenic complaints is collected by the inspection of the blood. I have found him to be practically correct.

Result in this case not reported.

Case XXXI.—Mr. W. Andrews, a spare-sized, well developed man, aged about 43 years at the time of his death. His family was not consumptive, but noted for energy, industry, and hard labor in farming. He was the feeblest of a large number of children. Attempted to learn the duties of agriculture, but was unable to bear its fatigues, although he was ambitious beyond his strength. He learned the trade of a carpenter and went to the West soon after. There, as might have been expected, he labored beyond his strength on timber work and contracted malarial

[1] American Journal of the Medical Sciences, April, 1866.

disease. He returned home, broken-down, about 1860. His spirits suffered from melancholy and depression; he was silent and reserved; had some cough, lost flesh and strength, and was judged by his relatives to be in a decline from tuberculous disease. However, the chest showed nothing of the sort, and under general careful treatment he recovered his health so that he resumed his carpentering, doing mostly in-door work. During this time he was more or less under the care of the writer. He improved so much that his love for farming was revived, and he left his trade and engaged in market-gardening on a portion of his father's farm assigned to him for the purpose. He continued on this about four years, and gave it up on account of weakness and trouble with his bowels, which consisted of pain and distress, associated with an evident abdominal tumor of an obscure nature, seated in the right hypochondrium. It was hard, tender, and about the size of a fist. Still he resumed light carpenter work, and continued in it till absolutely obliged to give it up from weakness and indigestion. He then rested and became much better. The abdominal tumor entirely disappeared. Obedient to his energetic will, he opened a hardware store in North Cambridge, and married. There he did well till the early spring of 1875, when he built a new house and undertook its supervision. This involved unusual labors and exposures, and resulted in his being confined to his bed with a somewhat alarming attack of lung fever, in which the upper left lobe was mostly affected. This affection apparently yielded to treatment for a short time. He had a cough not of any great importance, not much sputa, no signs of trouble in the lungs. Blood did not manifest any signs of trouble.

Still the case went on resolving itself into one of throat trouble, with partial aphonia. The epiglottis was thickened; the vocal cords were thickened, inflamed, and ulcerated. This was treated with topical applications of FeO,SO_3 and glycerine. The blood now showed a tuberculous taint. He was put upon the strict diet, acid baths, and tonics. While he followed this out faithfully his health improved; his throat, cough, and strength were better. His wife was not one who fully entered into the idea and appreciated the importance of the diet in cases like this. This is not to be wondered at, as the doctrines were new and strange. Although Mr. A. was himself fully convinced and willing to carry out the idea, still he yielded to the domes-

tic adverse influences, and went on to eat ordinary diet. The result was that his throat grew worse, the blood also presented more evidence of disease, physical signs of chest trouble appeared, and the advent of copious hæmoptysis sounded a death alarm which paralyzed the distressed wife, so that she gave him up in despair, and did not even encourage the measures proposed for his recovery, deeming him doomed to immediate, inevitable dissolution. Finding my efforts were thwarted, I ceased my attendance most reluctantly, as he was one of the best friends I ever had. Nothing was done for him as near as I can ascertain, and he died of exhaustion in December, 1876.

Remarks.—This case illustrates the need of encouraging surroundings. Not but that the case might not have recovered under the treatment, but that every opportunity was thrown away by the obstinate and unyielding will of his companion. The fact that he did yield readily before to similar treatment was encouraging. I have, however, learned that it is generally useless to try to carry out a diet treatment where there is no encouragement from those near at hand, except when the patients themselves are unusually firm of mind.

Case XXXII.—1877. Mrs. J. S. B., aged 29 years, mother ot four children, youngest eleven months old. Usually enjoying perfect health; came of a non-tuberculous family. Early in January she had a troublesome and severe felon, which was slow in healing, and was opened several times. She was suckling her child and doing her work. As this felon healed she was seized with a sore throat, so that when seen, April 25th, she complained more of sore throat than of anything else. To be sure she was weak, lost flesh and strength and had a poor appetite. Still, this was attributed to the lactation of her very large infant son, the felon, and overwork.

Inspection of the pharynx showed general inflammation of all its parts. The larynx also presented the vocal bands reddened and thickened.

Physical exploration of the chest showed nothing abnormal. Of this I was satisfied.

The blood, however, was loaded with spores and spore collects, fibrin filaments, débris, and enlarged white corpuscles. The red corpuscles were pale and thinned.

Here, then, was a marked *pretubercular case.* At the time of

the examination her second child had been smitten with diphtheria. The mother's sole attention was so confined to the child that there was no care taken of her, although her throat was gargled with iron sulphate, and she was told to go on the strict diet and baths.

The child's case proved to be malignant, and it died in the course of three days from seizure. Of course the sudden invasion by sickness and death of her household was productive of the most depressing mental and physical weariness. It is not necessary to dwell upon these incidents only to show their effect on the progress of the mother's disease.

On May 5th she was found to be very faint and weak—to have pain in the left chest and shoulder blade—accelerated pulse. Throat still sore; voice somewhat altered.

Over left upper third front rude respiration and dulness on percussion. Coarse râles behind; blood full as before, with the single exception of fibrin filaments. Ordered cincho quinine, 3 grains daily; salycylic acid, 15 grains at night. Case very grave.

May 13*th*. Followed out directions. Cough and systemic symptoms better; blood shows less of spores and spore collects. Fibrin filaments now distinct. The color of the red blood corpuscles has deepened.

23*d*. Some râles in right and left chests. Has had chills and night-sweats. Has weaned her child; still her general appearance has improved; cough troublesome; directed to use the nascent chloride of ammonium by inhalation. Had not lived up to her diet. Told to do so.

30*th*. There was some improvement in the symptoms, though the chloride of ammonium was not so effective as was hoped. She was faithfully enjoined to unremittingly use her remedies.

July 7*th*. At Brighton District, Boston, visiting. Since the last date, the writer was away from home on a medical tour west. Death had again entered the household and carried away the babe son with tuberculous meningitis. The child lay unconscious for one week before death. Dr. Salisbury, on being asked if the child could have taken the disease through the mammary gland of the mother, replied, "Yes." This view is supported by the facts that tubercle is a product of blood disease, that the milk was secreted from the blood of a diseased mother, that it was possible for the blood

disease to be thus communicated. Here is something worth following out further. (It is alluded to as a hint.) The strain upon the maternal life was terrible. It was a second stunning blow. Still she preserved a calm exterior, and appeared as if not conscious of her domestic trouble. She visited her relations after the funeral ceremonies, but despite the care she ran rapidly down. So that to-day her condition is as follows:—

Inspection.—Thin, pale, and very weak; chest much emaciated; blood presented increased evidence of disease, but not so much as on April 25th.

Percussion.—Dulness over left upper third front of chest; inspiratory and expiratory râles. Complained of night-sweats, great burning heat of the whole body, felt even through the hair of the head; pain in loins, palpitation of the heart, sometimes alarming, and piles. She had not lived quite up to the diet marked out, and had not used the baths for some time. Ordered a renewal of the diet; belladonna plaster to the heart; acid baths to be administered faithfully by a second person. Elixir quinine, iron, and strychnine; also, pepsin and bismuth (Wyeth). She was followed up closely, and the treatment watched. At this time it was questioned whether she had not better return home to die, fearing she might give out away from home. An invitation was extended to go to the sea-shore at West Falmouth, Massachusetts, on Buzzard's Bay, opposite New Bedford, and try the effect of change, and a rigid carrying out of the treatment, under the immediate supervision of my wife. But it was seriously thought that she was really too feeble. However, there was an immediate improvement in her most serious symptoms, so that she went to West Falmouth on July 14th, bore her journey well, but got very tired. The record reads: "Looks very bad, is sick and feeble;" night-sweats profuse, severe daily morning rigors, followed by alarming systemic fever, lasting all day and night. Blood full of the evidence of disease. It came out that at Brighton, despite the injunctions, she ate freely of peas and beans. The reader is requested to note that it is one of the most difficult things to carry out this diet list, even among well-meaning friends. It was so in this case. Now, also, please note the effect of the diet being strictly carried out in the writer's own family.

July 21st. Cough still bad; sweats a good deal; the fever is evidently lessened. She has ceased to take cold. This was

attributed to the peculiar, soft, bland, and balmy air of this peculiar locality, and also to the faithful exhibition of the baths, which had been neglected. The appetite was better. Her diet was administered regularly and strictly. Between meals she took Valentine's meat juice.

P. S. Blood presented many of the micrographical elements so often named here. There was dulness on percussion, and crackling over the left upper third, front and back; none on the right. Her throat was found to be so much inflamed, that it was touched with iron. This had the effect of allaying the cough somewhat.

28*th*. The intense systemic fever has left her! Expectoration copious; cough severe at night; blood showed mycelial filaments; spores and fibrin filaments more marked than on the 21st. It was found she had been allowed to eat ice-cream and clam chowder through the week, which introduced starch and sugar too freely. Ordered to adhere to the strict diet, made another application of the silver solution, which was severe as almost to cause suffocation.

Aug. 4*th*. An extra effort was made to carry out the diet, to see if the blood would present any less of the disease evidences. It did. There were no mycelial filaments, less numerous spores; fibrin filaments well marked. Red corpuscles were of good color, and well rounded, though aggregated. The fever had not returned. Very little cough. Evidently the silver application has benefited the throat. The patient was encouraged to perse-severe, by witnessing the blood changes herself.

18*th*. Strength improved; eats better.

25*th*. The blood showed more marked spores and mycelial filaments. She has been eating sweet corn, and the effects show in the blood.

27*th*. Returned to Woburn, Massachusetts.

Sept. 4*th*. There was an east wind about this time, and she took cold, and the left upper third front presented coarse and fine expiratory râles and dulness on percussion. Blood, however, appeared well.

15*th*. Sticks to diet; throat somewhat sore; looks well; cough increased since she returned home; dulness less in left side. The coarse and fine râles are drier. Blood improved.

Oct. 3*d*. Took cold last Friday, September 28th. Worse; coughing more, and raising more. Voice altered a little, sup-

posed to be the chief site of trouble. The palpitation has returned; soreness over the right side; constant shortness of breath; considerable body fever; no night-sweats; appetite good; no indigestion; feels heat begin in the shoulder; the heart's area of fulness marked and increased. Impulse very strong and purring on palpitation. Dulness, crackling, and amphoric respiration over left upper third front.

Not so many spores, fibrin or mycelial filaments found in the blood as was expected; red corpuscles very sticky; ordered veratrum viride; quiet and rest.

7th. Had considerable trouble with the heart, though it and the lungs appeared better. Blood does not seem to have suffered from eating white bread.

12th. Heart troubling again; dyspnœa; appetite still not good; been confined to the house; think her medicine causes a fulness of the head, making her feel unpleasantly and peculiarly; has eaten bread sparingly.

13th. The blood examined yesterday was kept in a zinc box containing a little water, and contains innumerable coffee-colored sporea with inactive movement. Fibrin filaments well-marked in serum and air-bubble spaces.

16th. Gave her quinine.

24th. Decided to try the effect of a trial of being nursed in my family again, as she was evidently growing worse at home. Came to Cambridge; heart is more quiet; feels a benefit for the change.

31st. Better, and ate a little wheat meal as a relish.

Nov. 7th. Returned home very much better; the cardiac dyspnœa has disappeared. On arriving home raised a bloodish sputa; coughs somewhat but feels no soreness; is attended by a professional nurse.

27th. Coughs more; voice thin; heart troubles her again; feels very nervous; a weakness and "fluttering" of the lower bowels; amenorrhœa; increased heat; thirsty. Lungs and blood not any worse. Disturbance thought to be uterine.

Dec. 3d. Reported better; in progress.

Jan. 1878. Declared she could eat the diet, but preferred to die than deny herself; changed to ordinary diet, and died in March succeeding.

Remarks.—This case remarkably exemplifies the Salisbury doctrine. The tuberculous taint was detected before the or-

ganic lung disease. However, when the disease was developed it was very rapid and acute. I never saw a consumptive case with such a fever heat of body. Indeed, it gave me the impression of its being a case of galloping consumption. Under the circumstances the history, I think, sustains the idea that food is an agent of tremendous power as a pathologic and therapeutic. It was a power for life or death in her case, for when she abandoned her diet and resumed the ordinary starch one, she sank like a stone thrown into the sea.

CASE XXXIII.—Oct. 23, 1877. Miss ——, of New Bedford, Massachusetts, a pale, thin, apathetic housekeeper of 34 years, took a *severe* cold on exposure, last April. Her *health was run down before*, and she had cough with copious white, tough, and thick sputa. She took brandy, milk, and cod-liver oil up to September 23d; family not tuberculous. At present time complains mostly of being tired, of inability to do much work; coughs and raises all the time; sometimes is asthmatic; voice changed in timbre; lost flesh; amenorrhœa; throat sore; appetite poor. Never has got back the bright look of health she had before being sick.

Physical Signs.—Dulness on percussion over right upper third front and back; sonorous and sibilant râles throughout the right lung; heart's sounds normal; impulse very strong. *Blood:* Spores, spore collects, fibrin filaments; red corpuscles massed. *Throat:* Arytenoid cartilages thickened and inflamed.

Diagnosis.—Tubercle. Here the diagnosis was confirmed by the blood evidence.

Treatment.—Citrate of iron and quinine; acid baths; strict diet. She promised a faithful adherence to the course.

She was much better for a time, but afterwards relapsed and died. I did not see her personally, but infer that she gave up the diet wholly or in part.

CASE XXXIV.—W. E., age 33½ years, residence Baltimore, Maryland, furniture dealer, was seen Oct. 23, 1877. His family not tuberculous. States that he was always subject to cough; that last April he took a cold, on exposure. The cough was not at first severe, but it increased in severity; the sputa were not copious. On four separate occasions, when coughing very hard, had had copious, violent, and alarming hemorrhages from the lungs. The color was arterial at first, and afterwards venous.

He is almost aphonic, though an incessant talker. Sweats nights, but not copiously; has lost strength, but not flesh; is short-breathed on exertion; appetite always good, and diet has been mostly animal food, with potatoes largely thrown in.

Physical Signs.—Throat: Vocal bands, inside of larynx and arytenoids reddened and thickened. Epiglottis normal. *Thorax* well developed; dulness on percussion, and crackling râles over the left side, front and back. Heart's sounds normal, pulse 100. Respiration 32, sometimes catching; increased impulse; area and quality of cardiac dulness on percussion increased. *Blood* presented the usual signs of tuberculosis, but not marked as usual.

Diagnosis.—Laryngeal inflammation, tuberculosis, and cardiac hypertrophy.

Treatment.—Vocal rest by perfect silence; belladonna plaster to præcordium; blister, and a wet pack to left lung, upper third front; hydrochloric acid bath; Wyeth's elixir of quinine, iron, and strychnia, thrice daily; strict diet. Prognosis doubtful.

Nov. 3d. Better.

6th. Came from Manchester, New Hampshire, to Boston. Has dulness and crackling over the upper third front; heart's dulness still persists. Dyspnœa on exertion, attributed to weakness. Larynx has improved by rest, and phonation is better. Touched the larynx with the liquor ferri persulphatis and glycerine, equal parts; baths and diet continued. One gallon of milk a day advised.

9th. Voice natural; general appearance improved more than expected; coughs so as to cause vomiting at times; touched the throat as before.

13th. Voice good; cough very troublesome; sleeps well; appetite impaired. Don't eat, unless he forces it as medicine, and then does not receive enough to satisfy him. Throat feels worse.

16th. Stronger, but short-breathed still. Throat and blood appear improved. Application made to throat.

23d. Complains of pain in lower part of the left thorax, and it being hard work to get enough to eat. Allowed him more liberty in diet, because it was thought better to compromise, and let him have a slight change of food, than to be too strict. This was to consist of potatoes taken sparingly as a relish. He found chicken and lobster salad very satisfying to his palate.

27th. Returned home to Baltimore, under strict injunction to his wife and family physician. The case is still in progress. Reports that he is well January, 1878; also August, 1879.

CASE XXXV.—Mr. T. D., laborer, Irish, 50 years of age, resides in Woburn. April 31, 1877, presented himself for advice. Has been a subject for ten years or more of what appeared to be locomotor ataxy, so that he was all bent over and curled up, and walks with a peculiar shuffling gait. His complaints were of cough, copious expectoration, emaciation, loss of strength, pallor. The expression of countenance was a very peculiar, impassive one. Physical exploration showed the lungs affected with dulness on percussion, and crackling and sonorous râles on auscultation, over the left upper third front, and, to a less degree, over the same part on the right. The blood revealed by microscopic examination spores, fibrin filaments, pale, sticky, aggregated, red corpuscles, all in a positive degree of character. He was placed upon the acid baths and strict diet. On May 29 I called at his house, and found him confined to his bed, his demeanor and bearing indicating that he was suffering in great distress. His breath was short; his countenance was indicative of very grave systemic disturbance; pulse quickened; cough troublesome. Said that not long ago he had had, while coughing, a sharp, sudden pain of agony in the left upper chest, and ever since he could not get his breath fully and satisfactorily. He was unable to turn over on his side, and was almost orthopnœic.

An examination revealed, over the left upper third of the thorax, tympanitic percussion, metallic tinkling, and splashing on succussion. Lower thirds flat, respiratory murmurs absent. *Diagnosis:* Pneumothorax, with effusion. Evidently the lung had been penetrated and collapsed. Some direction for local relief was given, and animal diet was enforced. He was left with the expectation of never been seen again alive, as the writer went on a journey west.

Aug. 3d. Mr. Dolan astonished me by coming into my office, in Boston, as I supposed him dead. His cough was slight. Over the left upper third front the percussion was clear, tympanitis gone, the respiratory murmurs were normal, in place of the metallic splashing and tinkling. No abnormal sounds were heard, except some sonorous and crepitant râles over the right lower third, back. The blood showed a few spores, and faint

fibrin filaments. The red corpuscles were amber colored, well defined and rounded out, but aggregated. He had faithfully carried out his diet.

At last accounts he continued as well as usual.

Remarks.—One who is enthusiastic like myself could not help recording the word "wonderful" against this case. The facts show plainly the tremendous power of food as a medicine. Whatever results have followed its use in other cases, those that occurred here are certainly bordering on the marvellous to me, for with all my great confidence in food as a medicine, I did not think it would cure this man. I feel rebuked for my want of faith in this instance, and feel myself under renewed obligations to publish my experiences.

CASE XXXVI.—Miss Lizzie D. Carr, July, 1877, Fall River; a most estimable lady, well formed and developed, submitted herself for examination as to a pulmonary trouble. The family was consumptive. She had cough, some expectoration, pain in the right side, dyspnœa on exertion, lost flesh and strength. The chest presented dulness on percussion, with tubular respiration over the lower half on the left back side. The lung appeared as if hepatized. There was diminished resonance on the right, and occasional crackling râles scattered about both lungs. The throat was decidedly inflamed, especially in the pyriform sinuses. The blood presented well-marked spores, spore collects, and fibrin filaments. The result of finding so marked disease was unexpected as the patient's general appearance was so good.

She exercised her well-endowed mind and firmness in carrying out the regimen of diet and bathing, with tonics occasionally, and local applications to the throat. The climate of her home was regarded as very depressing, being a locality elevated, with fresh water lying to the east, and salt water lying to the west. She improved in cough and general health. The dulness was a long time in dissipating. In October she presented a remarkably healthy appearance; the blood was very much cleared up of foreign substances; the cough was almost nil, and everything looked auspiciously to a good recovery. She went to Amherst, Mass., to be out of the way of the seashore. She did not find exactly the kind of diet she needed; it was impossible to live on the strict diet. This ought to have condemned the place at once, and she should have left it, as the chances would have been better with a good diet in a poor atmosphere. The wea-

ther was severe and trying; she took a cold, and began to run down, so that in February, 1874, she was forced to return home. Pulmonic dulness on percussion reappeared at the right side; also coarse râles. Despite of medical and judicious care and nursing she ran down, and died in the spring of 1875. She yielded at first so readily, that it was hoped the issue would have been of a different character.

CASE XXXVII.—Mr. J. D. Carr, brother of Case 37, was older and had been for four years in consumption. In the spring of 1874 he was examined, and extensive disease was found in his throat and lungs. There was dulness on percussion and diminished resonance in the upper part of the chest. Coarse and sibilant râles were abundantly present. There was no cavernous respiration; the larynx was ulcerated somewhat. The blood displayed marked evidence of disease.

The patient had become accustomed to invalidism. He spent most of his time out of doors, boating, fishing, and riding. He was very active, and did some duties as a surveyor's assistant. He said as long as he kept out of doors he felt well, but thought he would live but a short time if shut up in the house. His throat was touched with the iron solution. He went on to the baths and diet. He certainly improved under treatment so that he spent the *winter* in the Adirondacks, and came out in very good condition for him. His blood appeared less filled with the evidence of disease, but the pulmonic symptoms did not abate as much as his sister's. However, in the summer he engaged as a clerk on board of a harbor steamer. January, 1880, he died.

Remarks.—It is difficult to estimate the value of the diet treatment in this case, as he had been sick for four years previous. Still, the improvement in strength, cough, and spirits was marked, as at the time the case was undertaken he was very much at a loss to know what to do with himself while he was longing for some active employment that would benefit some one else beside himself. One of the most difficult things to manage in consumption is introspection; the mind needs diverting away from one's self. The reflex influence of good done to others by one's labors is a powerful stimulant and tonic. "No man liveth to himself."

CASE XXXVIII.—Mr. G. W. Fulton, an apothecary's clerk,

aged about 24 years, tall and well developed, was sent to me by Dr. J. R. Mansfield, of Wakefield, Mass., July 8, 1876, with the word that he was in consumption. He had been prosecuting the duties of his position, but had lost vigor and flesh. Had suffered several attacks of hæmoptysis. Cough troublesome; night-sweats.

Physical signs; Inspection.—Throat: Inflamed on the posterior pillars of soft palate. *Blood:* Filled with spores, spore collects. Fibrin and mycelial filaments well marked. Red corpuscles pale and aggregated. White corpuscles enlarged and too numerous. Family consumptive. He went on to the Salisbury plan, and received topical applications to his throat. He was very faithful, and made a rapid improvement in all respects. In order to fully develop the antero posterior diameter of his chest he used one of Cutter's apparatuses for compressed air. This he was obliged to use with caution, as he found it to induce hæmoptysis. In November he removed to Boston Highlands.

Dec. 19*th*. Feels quite well. Blood presents a comparative freedom from micrographic appearances. No râles detected in lungs. Percussion clear. Capacity of chest increased. Is taking cod-liver oil, allowed as an animal food.

Jan. 1877, while we thought he was doing very well, he was attacked with a violent and copious hemorrhage from the lungs. This reduced, weakened, and discouraged him; still he adhered to the diet and baths, and was restored to his condition before the last difficulty.

His cough and expectoration were slight. There was less dulness in the affected portion of the lungs, and less crepitation. He resumed his business, but fearing the effect of the east winds in spring he thought it best to go inland to Moscow, New York, where he was residing comparatively well at last accounts. He said it was his intention to go to East Tennessee, a project that I encouraged. The system and local signs of his case were certainly greatly improved by the diet. He had no fear of death, and was not over anxious to get well.

Oct. 1879. Reported to be living in Tennessee in good health comparatively.

Case XXXIX.—In October, 1874, Mrs. Levign, a middle-aged woman, pale but not thin, childless, French descent, a great worker, was examined for tuberculous disease. For some time her health had been bad, as she had besides uterine disease.

Cough with scanty expectoration, and thoracic pains were common. In the right upper third front of chest there were distinct, well marked crepitation on auscultation and dulness on percussion. The blood presented fibrin filaments, spores, and spore collects. Under the influence of the Salisbury plan she improved well, so that she was able to continue to do housework steadily and to perform her duties in life and station acceptably. She was a person of strong mind and considerable energy of character. Her husband's means were ample. She continued well at last accounts.

CASE XL.—August 15, 1874, Miss Alicia Quimby, school-teacher in Boston, residing in Winchester, aged about 24 years, was a woman of rare qualities of mind. Father and mother both died of consumption within a few years. Her own illness was more than a year's duration. During the winter of 1873 she was acutely sick, so much so as to be confined to bed. In the spring of 1874 she got better and resumed teaching again, and it was in her summer vacation that she presented herself for examination and treatment. She complained mostly of her throat, which was inflamed, and in the larynx presented a thickening of all its tissues. Both lungs were extensively diseased at the apices as indicated by dulness on percussion, crackling, sonorous, and almost cavernous râles. At the bases of both lungs, behind them, were râles, but no diminished resonance on percussion. Heart sounds normal. Impulse strong and quick. *Blood* filled with fibrin filaments. A few mycelial filaments, abundant spores and collects. There was considerable dyspnœa and panting on exertion, probably from the impairment of the lung's capacity.

The diagnosis was unmistakably tuberculous from every point of view, and the issue was regarded as certain sooner or later by both patient and physician. Still with all the odds against her she desired to do all she could for her relief.

Feeling disposed to aid, the writer encouraged her as much as possible, and her history shows what can be done in the most unfavorable cases. She had about given up to die, and had relinquished her school engagements.

Never was a patient more strict in carrying out the directions to the letter. When told that she might occasionally have bread made from the *whole* wheat she went to work and with a

rare ingenuity prepared loaves literally from the *whole grains*, and it was by accident, mentioning the difficulty in so doing, that my attention was called to the mistake made; whole wheat means the wheat ground and used without bolting or sifting! The baths, *the diet*, the throat applications produced such an improvement that she entered upon her duties in school in Boston, daily riding to and from Winchester. The physical signs of the thorax and blood certainly improved. The cough was confined to the morning, and the expectoration was almost *nil*. She continued in the discharge of her professional duties till the school-year closed. When the vacation came she was tired out, and began to be much troubled with her heart, having paroxysms of dyspnœa and panting. Soon she had large hemorrhages from the lungs that both weakened and frightened her. The brave heart gave out dismayed. Symptoms of pericardial and endocardial inflammation set in. The pulmonic disease rapidly increased, and death put an end to her courageous fight for life made so bravely.

Remarks.—"If these things are done in the green tree, what may not be done in the dry?" The lesson left by this martyr is, it seems to me, not to be lost. Her heroic example shows that if such a marked improvement could be made in a case so far advanced as hers, if it could be held in abeyance by diet of a certain kind, what may not be expected in relation to this disease when those who are inevitably to become the victims of consumption ward themselves against its attacks by excluding an excess of starch and sugar from their dietary? Is it expecting too much to affirm that the present prevalence would be very much checked by living on food unfavorable to tubercle development?

CASE XLI.—Mrs. Wilmot, widow, middle-aged woman, a cockney of London, England, now a nurse. Naturally pale and thin, nervous, and not strong, but tasked to support herself and family. She lived in an old damp house, in which she took cold, and was confined to bed with chills, followed by fever, cough, copious expectoration, pain in chest, upper part left side. At this point there was dulness and crepitation. These acute symptoms were followed by severe hemorrhages from the lungs.

The blood showed unmistakably the presence of spores, fibrin filaments, enlarged white corpuscles, débris. The acute symp-

toms received treatment with counter-irritation, arterial sedatives, rest, and good food. Under this treatment she recovered partially, so that she was able to be about and perform some of her duties. Finding out her extreme poverty, the writer supplied her for a time with animal food as a medicine.

Soon after the writer removed from town, and the food supply ceased. She ran down, and died not many months afterwards.

Remarks.—These cases of partial carrying out of the diet may, perhaps, be regarded as of no value, except to injure the case in hand. But it may be asked whether the fact that such a grave case was arrested for a time is not of some significance to aid in pointing out the road that must be taken by the non-tuberculous, in order to *avoid* this disease. If she had enjoyed the boon of plentiful food, good care, and housing, would this history have been written?

Case XLII.—June, 1874. An Irish currier, aged 21 years, was examined in relation to a thoracic complaint. He was tall, pale, thin, and wan; his cough was chronic and troublesome; sputa white, thick, and copious; no blood; night-sweats. He had been sick for several months, and had been obliged to give up his occupation, on which he depended for a livelihood. The chest presented marked signs of disintegration of the lungs at the apices. There was dulness on percussion, and soft sonorous râles at the same place; the blood was heavily loaded with interstitial substances. Though an unpromising case, he went on the Salisbury plan. There was marked improvement in the rational signs. He went to California, where he resided for some time, and finally died, though his condition was ameliorated at first.

Case XLIII.—*July* 8, 1877. Miss M. Johnson, aged about 36 years, some years ago lost an elder sister, who died of consumption; occupation, gentlewoman. Has been sick since last March—probably much longer. Complains of weakness, of loss of ambition, literally and figuratively; of cough, and expectoration scanty; no blood as yet; no sweating nights.

Physical Signs.—Crackling, cavernous respiration, dulness on percussion over left upper third front of chest. *Throat:* generally inflamed and reddened. *Blood:* Showed very large white corpuscles, spores, spore collects, fibrin filaments, red corpuscles,

pale, sticky, aggregated in masses; no nummulation. *Uterus:* Anteverted; irritable. Went on the Salisbury plan of treatment.

21*st.* Blood improved; diminished amount of spores; fibrin filaments strongly marked; still weak; bilious; mouth dry. Ordered chloral as a gargle, quinine for weakness, chloride of ammonium for liver.

Aug. 2*d.* Dieting is hard work; still she is courageous, self-denying, and strictly adheres to diet, but is better systemically and sanguineously.

9*th.* Dulness less. Only a few crepitant râles in the lower left back of chest.

Sept. 1*st.* Dulness increased over left upper third front; coarse and fine râles in the same place; feels stronger.

12*th.* A small hæmoptysis.

13*th.* Physical signs of disease in left lung much increased. Blood about the same; still, strength and appearance is good for her.

18*th.* Left for Vermont; coughs more; blood presents more of the special appearances; touched the throat with nitrate of silver, and used vaseline in the interim.

Oct. 17*th.* Returned; appetite much improved; blood clearer than ever before. Dulness and *dry* crackling in left lung. Feels encouraged.

24*th.* Visited and tired out by crowds of friends; excitement too much for her; nausea; anorexia; sleeplessness; blood appears well; soft, semi-solid crackling; dulness left upper third front; right chest clear and normal; no cough; distress in breathing felt under the sternum.

31*st.* In bed. On the 28th, had a hemorrhage of clear, fresh blood, about one teaspoonful. Irritative fever for two days and nights; limbs feel strong; expiratory crackling tubular respiration over upper third, etc.; pulse quickened. Ordered FeO,PO_5, or pyrophosphate of iron for the heart.

Dec. 1*st.* Hysterical, nervous, very much depressed in mind and spirits; numbness, alternating with tingling in limbs; looks badly; skin and pulse natural; coarse and fluid rhonchi in left upper third; cough hardly noticeable; breathing quiet. It was thought strange that the pulmonic symptoms were so much held in abeyance.

6*th.* Local disease is increasing.

24th. Bladder overdistended with urine, and rose to beyond the umbilicus. Distress agonizing; catheterized at least two beer quarts of urine. Subsequently she could not evacuate the bladder without aid.

Jan. 6th, 1878. Died unconscious. Great emaciation and nervous prostration, but hardly cough or expectoration for some months; still, there was a progressive decline in spite of this, and the diet certainly seemed to show that it was a good cough medicine. Few die in consumption with so little lung irritation. The disease about the pelvis was singular. It was thought unadvisable to treat the uterine trouble, because of the greater evil in the lungs and blood. Still, the history shows that she suffered most from the direct and reflex irritation of the genito-urinary organs, and the writer regrets that more interference was not made with them. Dr. D. W. Wight saw this case often, in consultation, and rendered material aid in its management. Certainly she was a heroine in her endeavors to ward off the evil.

SERIES III.

ARRESTS THAT WERE MORE PERMANENT IN CHARACTER, AND MIGHT BE TERMED CURES, IF OCCURRING IN OTHER DISEASES.

CASE XLIV.—In 1865, Miss C. B., a lady aged about 20 years, had cough, expectoration, wasting of flesh, loss of appetite, paleness, combined with dulness on percussion, and crackling over the right lung upper third front. She was predisposed by hereditary taint, and the great change of her character from a lively and cheerful, to a sad and silent demeanor, tinged her prospects with a dismal hue. Her family was thoroughly alarmed, and her energetic, systematic, and thorough-going father prosecuted the carrying out of every measure that promised any success. Animal food diet was insisted on as a means of infusing new life and vigor into the apathetic frame. Some mild tonics were administered, and a change of air. The diet was repulsive, but the paternal energy insured its constant carrying out. The result was an immediate improvement, followed by an entire recovery, which has remained permanent, under the wear and tear of life, until the present time, over thirteen years—1878.

CASE XLV.—In December, 1862, a man by the name of Clay was confined to the house by what was deemed by my father,

the late Dr. B. Cutter, of Woburn, Massachusetts, double pleurisy, combined with tubercle. There were flatness on percussion and absence of respiration over the base of both lungs, crackling and diminished resonance on percussion over the adjoining portions of the lungs, severe cough, loss of flesh and strength. The length of time sick, the general debility, added to the fact that the medication employed appeared not to influence the case in the least, induced the writer to coincide in the opinion expressed by his senior. This judgment was confirmed by several visits and examinations. One day we visited him together, and both gave him decidedly to understand that it was useless for us, or any one else, to attempt to benefit him, as a recovery was out of the question. On leaving the house, and taking our sleigh, the writer's attention was arrested by the appearance of a very good looking, fattened hog, lying in a pen near the house. The thought came to me that here was a chance to get cod-liver oil, without unusual expense, as pork fat, I thought, contained most of the fat acids and glycerine of cod-liver oil. It took but a moment to jump from the vehicle, run into the house, and exclaim, "kill that pork, and eat nothing else this winter," making thus—unconsciously to myself—a strict animal food diet list for the patient. The laconic direction was obeyed, and, without any direct medical attendance, he recovered; is yet alive, and at work in a tannery, able-bodied, and capable of endurance like any other man—1880.

Remarks.—This case was an enigma until some time afterward. I had preferred and settled down into the belief that the diagnosis was wrong, and that the good result was a chance shot, and an unaccountable procedure. But from what is now known as to the effect of food of this character upon tuberculous disease, it appears to belong to the present category. But allowing there was no tubercle in the case, the abeyance of the physical signs and the restoration to health are remarkable and no want of recommendation to the use of animal food as medicine. Its simplicity, availability, and success should secure for it a respectful attention and consideration in the treatment of this subject.

Case XLVI.—Kate G., aged 16 years, in Sept. 1873, buried a sister aged 18, who died of consumption. A brother ailed with cough and loss of flesh, with general malaise, went to California

to escape the fate of his sister, and with success, it has been reported. About Christmas, 1873, Kate was sick; she had a small hæmoptysis, cough, loss of flesh and strength and appetite; which symptoms, taken in connection with the history of the family, were sufficiently alarming. On examination, dulness on percussion with crepitation was found over the right upper third front; her blood was full of spores, collects, fibrin, and mycelial filaments. She was put upon the Salisbury plan of treatment; she improved, and was seen only three or four times in all, and it was inferred that, like many other patients, her courage gave out, and that all that had been gained was lost, or that she had secured the services of some other physician. Nothing was heard from her, until my wife needing the services of another girl she presented herself as a candidate for house-servant, with a poise and countenance indicating perfect health, in full bloom of youthful maidenhood. Except a slight nasal catarrh she had no ailment. Under the circumstances of undoubted tubercle in the family, and the usual inevitable march through children just turned of puberty, the restoration to health was regarded as a confirmation of the value of animal food as a medicine in a disease ordinarily so fatal at her time of life. She is now living in good pulmonal health; her chest and blood showed no signs of disease at a recent examination, nor were there any systemic signs of disease.

Well in Sept. 1880.

The writer thinks that if this history was connected with some disease of dissimilar name it would be recorded as one of *cure*, only because the idea of curing consumption has been associated with impossibilities, quackery, and charlatanism. Shall we say there are no advances in our knowledge of disease to be gained? At any rate Miss G.'s case may be classed as a permanent arrest.

CASE XLVII.—In July, 1872, Mrs. McLaughlin, C. District, Woburn, was sick with chronic cough, emaciation, expectoration copious, no blood. She presented the physical signs of dulness on percussion, and expirating crackling well marked over the upper part of the left lung. She was aged 50 years, and had buried a daughter, not long before, who died of consumption. Was it contagious? The surroundings, domestic, hygienic, and telluric, were bad; she lived in a low, wet locality, redolent with the odors

of the beam-house of a large tannery. Still she faithfully carried out Dr. Salisbury's plan of treatment, and the result was that she got well. Her blood became cleared up of foreign matters, and she presented signs of systemic improvement which have remained permanent up to the last advices. She took in the idea and carried it out. As our religionists say, saving faith and works go together to produce physiological good results. There is, in my opinion, nothing to prevent the essence of tubercle being conveyed by the breath or sputa.

Case XLVIII.—In May, 1875, Miss L., aged 24 years, a medium-sized, dark-complexioned lady, was seen in consultation with Dr. S. Stevens, of Stoneham, Mass. She had relinquished her occupation as teacher in a private school on account of her ill-health, and had left her home in Dorchester to sojourn in the country for the sake of her health. She was not much emaciated, eye clear, strength moderate. She had been sick a year, more or less; cough, with expectoration; no pain. Some dyspnœa and diminished strength. Consumptive family.

Physical Signs.—Over the right upper third front and back was marked dulness on percussion; also crepitant râles and tubular respiration. The blood showed spores, collects, and fibrin filaments. There were night sweats, and her attendant, the venerable and discriminating Dr. W. F. Stevens, regarded her as running down rapidly. She was, however, surrounded with the most favorable influences as to the means and encouragement in carrying out the strict diet, acid baths, etc. She ably seconded the circumstances by faithfully carrying out the directions given. She never wavered or faltered in her course. The improvement as to night-sweats, cough, expectoration, and strength was prompt and marked. Still the dulness was long in leaving. She resumed teaching at the close of her summer vacation, and regarded herself as entirely cured, as the dulness left, and she felt as well as she ever did. She continued to teach until a chosen gentleman made her his wife the next season but one. She continued also in good health, until lately she was found to be suffering with a uterine fibroid multilobar pelvic abdominal abscess. She was doctored by a female physician for fecal obstruction! Drastic purges were given to remove it. The blood shows some signs of trouble; the lungs are free from crackling; respiration puerile over site of former disease.

Remarks.—It would be easy to bring on the old trouble by reducing treatment. Perhaps some would say this was not a permanent arrest or cure. But suppose it had been a case of dysentery with severe enteric lesions, marks of cicatrices, functional weaknesses, and sympathetic distress always more or less clinging to it even after years have elapsed, still we term it a recovery. So of a wounded soldier carrying a bullet that the surgeon could not find. We call it a cure when he can perform the duties of his station in life. So I think this case has claims to be called a permanent arrest. The future of the case will be of much interest, as it is proposed to try Dr. Salisbury's plan of dissipating fibroids by means of the strict diet. (See Cutter, *New York Journal of Obstetrics*, Oct. 1877.)

Case XLIX.—Mr. Ezra Gireaux, wheelwright, Canadian, medium-sized, active, a skilful workman, was seized in 1873 with a copious hemorrhage from the lungs. He had cough, moist sputa, loss of flesh and strength, and the chest presented the signs of commencing disease of the lungs. There was considerable action of the heart, which was calmed by the use of the tincture of veratrum viride. Alcohol was applied to the chest outside. Cessation from labor was enforced, and the Salisbury plan put in practice. This was followed by a complete recovery, and the man is at work at his trade as before. The promptness manifested was surprising; it was such that the relation of cause to effect was very marked.

I don't say but that other treatment might have done as well. Luckily there is more than one way to do a thing. But the above is a true account of the history as it occurred.

The writer does not claim infallible diagnosis, nor challenge belief simply because he says so. But if he counted out this case he would do violence to his feelings of duty.

Case L.—Mrs. Woodbury, Lanesville, Cape Ann, Mass., a hard working woman, in the spring of 1873, had marked trouble with her throat. She had also weakness, emaciation, cough with expectoration but no blood. Been sick for a long time.

Over the right lung, in the upper part, there were dulness and crepitant râles. The blood was full of the evidence of morphological disease, corroborating the systemic and local symptoms. She faithfully pursued the Salisbury plan, and received topical

application to the throat, which was inflamed and ulcerated at the posterior pillars of the palate. The general health was re-established when last examined in 1877, the blood appears healthy, the dulness has disappeared, and the only sign of pulmonic trouble is now an occasional crepitation in the right lung.

She has, however, some uterine difficulty that disturbs her nervous system. Still she is regarded and regards herself as permanently cured practically.

CASE LI.—Mrs. Hon. J. H. A., 34 years of age, a fair complexioned, robust looking woman, states that her family are all but her dead from consumption. They all appeared solid, florid, and well, yet died. Her mother, up to the very time of death, presented the bloom of health, and "was handsomer than I am." Thus parents, brothers, and sisters passed away.

In 1866 Dr. Buzzell, of New York City, found her suffering from hæmoptysis, cough, and copious expectoration. He sent her across the Atlantic to the mountains of Wales, and put her upon an exclusive diet of mutton, beef, and milk. On this strict diet she recovered entirely. In April, 1877, she was under the weather from various causes, and I examined her blood and found fibrin filaments, strongly marked spores, spore collects in abundance, mycelial filaments large, long, and copper lined. There were no physical signs of disease in the lungs. Considering the disease of 1866 she was regarded as a post-tuberculous case rather than a pre-tuberculous one. There was no telling how soon the organic lung disease might reappear.

She was put upon the Salisbury plan, which was faithfully carried out. In July, 1877, found her very much improved. She had lost her general malaise, weakness, dyspnœa, pain, and nervous disturbances. Her blood was found cleared up of the fibrin and mycelial filaments. The hematic interspaces were clear with here and there a spore or two. Recovered.

Remarks.—This case was interesting from its recovery in 1866 in Wales and by diet; later by the same diet without expatriation, and from its apparent bloom of health. Prof. W. Gibson, of the University of Pennsylvania, in alluding to consumption during his lectures in 1854–55, states that he had seen many patients who were in advanced stages of disease, but yet presented the apparent full florid complexion of health. The writer has

seen a similar thing in the case of his only sister, who had a fine florid complexion, and yet died from apoplexy, and presented, on examination afterwards, a fatty heart and kidneys.

CASE LII.—A German salesman, 32 years of age, born in Hamburg, tall, pale, thin, white haired, and nervous temperament.

Aug. 25*th*, 1877, presented in his right lung dulness and diminished resonance on percussion, and wavy expiration at the upper thirds, and at the lower thirds front and back coarse expiratory and inspiratory râles. Left lung normal. There were cough, expectoration, debility, and abject feebleness, so that he had left his employment for the past two weeks at least. He was afraid of tubercle himself.

His blood contained spores, spore collects, and fibrin, and mycelial white colored filaments. His appetite was *nil* for everything but milk and eggs. He had night-sweats, and his cough was troublesome. No hæmoptysis.

Treatment.—He was allowed to continue a tonic that he was taking. Acid baths. One gallon of milk a day, besides all the eggs he could eat. He expressed himself capable and willing to live thus.

Sept. 4*th.* Feeling very much better. No cough. Night-sweats gone. Spirits and strength improved. Feels now as if he should recover.

Sept. 14*th.* Returned to work and was reputed as well.

Remarks.—No moıe is desired to be made out of this case than facts warrant. There might have been a mistake in diagnosis. Still the rapid improvement and recovery should not be brought up against the means used. One gallon of milk daily furnishes a large amount of tissue food, and is an agent of great power, to say nothing of eggs. Both milk and eggs stand chemically and physiologically at the head of all dietetic articles. The result was startling and unexpected to the writer, as he had expected a tough and long resistance! It teaches not to despair too soon. "In the morning sow thy seed, and in the evening withhold not thy hand, as thou knowest not which shall prosper."

Let this case be judged of in connection with the others—not alone. It is history and must go for its worth.

CASE LIII.—Mrs. T. Wall, East Cleveland, Ohio, June 21, 1877. Present condition.—Suckling a four months' child. Ac-

tive and doing her own housework. Looks like a person in ordinary health. Coughs occasionally. No sputa. A good sized, rather flat-chested woman thirty-five years of age.

Physical signs.—Chest: Dulness on percussion and cavernous respiration over left upper third back. Dulness over the whole left back. Elsewhere normal. *Blood:* Inspection showed a normal looking blood. Red corpuscles not massed, distinct, well defined, rouleauxed, no fibrin or mycelial filaments, white corpuscles enlarged.

This report is more interesting when taken in connection with the following—

History.—In February, 1865, Mrs. Wall had been sick in bed four months with the last stages of consumption. She was emaciated to a skeleton; weight sixty pounds, usual weight one hundred and thirty pounds. Her physicians, who were regularly educated and skilful men, pronounced her left lung "gone" —that is riddled with tubercle that had softened and broken down in such a manner that the pulmonary substance was removed—had become useless, and of course they gave a decidedly fatal prognosis. There was at this time a great caving in or flattening of the antero-posterior diameter of the chest due to atmospheric pressure conjoined with loss of lung substance. At the time named she was put upon the Salisbury plan. This the patient's mother caused to be faithfully and assiduously followed out. Improvement slowly followed. In four months' time she was able to be out of doors and visit the city. After a time she resumed her profession as school teacher, and taught successively and successfully for four years. Five years ago she married, and has borne three children, all healthy and vigorous. She likes her meat diet the best of anything, lives on it, and works hard. The physical signs adduced show the marks of the ruin wrought in the lungs, and also show the tremendous power of food in managing or in affecting the course of organic pulmonary disease, even in its third and hopeless stages. This history reads like fiction. It is stranger than fiction. The writer made a special business of visiting the patient in person and ascertained these facts, by examination himself, for the very reason that it is one of the surprising sort that challenges belief of sensible men.

A remarkable fact in this case is that, when the appetite was established, it became ravenous, and large quantities of animal

food were daily consumed, until health was regained, if cicatrization and healing can be called so. The antero-posterior diameter was increased.

It seems to me that an arrest should be called a cure, in the ordinary sense of the term, although the marks of the injuries are not obliterated. This is one of Dr. Salisbury's cases.

Case LIV.—Miss Mary T., aged 18, a pale, wan girl, coughing for some time, with copious purulent expectoration. Over left lower third back crepitant and sonorous râles, and diminished resonance on percussion. Family *not* consumptive. Blood examination revealed many spore collections, spores, no fibrin filaments. She had lost flesh and strength, and the pulmonic disease was local.

Diagnosis—Tubercle, because it is not often the case that bronchitis is limited to the bottom of one lung, and with dulness on percussion. Latent pneumonitis is also rare. Effusion would have hardly been so limited for so long a time; this was in March, 1877. In December, 1877, her mother states that she followed out strictly her diet; that she rapidly improved in every respect, and regained such perfect health that she thought she would resent the interference of a doctor, and that she had charge of a number of girls in a shoe shop. She was regarded as permanently cured.

Case LV.—A middle-aged Irishman, laborer, was seen in the dispensary practice of the city of Cambridge, December, 1876. He was presented as a case of undoubted consumption by the dispensary physician. He had chronic cough, copious expectoration, dulness on percussion, and fine crepitation in both lungs, upper thirds. Had lost flesh and strength, and had been obliged to give up work.

His blood was first examined at a meeting of the Cambridge Improvement Medical Society, and I was unable to make out any signs of disease. This afterwards proved to be due to the distance between the gas-light and the microscope. The demonstration was not satisfactory to the writer nor to the physicians present. The expectations were not realized, and those that were present probably set down the trouble to the thing itself, and not to the means employed. However, the failure to demonstrate was far from being *proof* that the signs were absent,

and those who based their notions of the matter upon this failure were wrong, as, when the man came to my office subsesequently, his blood presented the spores, fibrin and mycelial filaments, enlarged white blood corpuscles, in well marked characters.

It is never well to make demonstrations in disputed cases, unless one is sure of his case, and apparatus, as for the time being any failure to show the expected thing is charged against the evidence itself. For this reason, when a person fails to establish a point by a demonstration, he should not be wholly condemned. Collectors of objects of natural history do not always succeed in securing the desired fauna or flora, even though they may be present when searched for. Because fish are not caught on a given excursion, the disappointed anglers regard it as no proof that there are *no fish* in the water, especially when they *see* them swimming placidly below! It is impossible to strike twelve all day. These words are for the encouragement of demonstrators.

The man went upon the strict diet, and said he faithfully carried it out. Besides, he took cod-liver oil and iodine, one a food, the other an alterative, and appropriate remedies for his case. He got well entirely, and because he recovered, the case was set down as syphilitic consumption, and not *tuberculous.*

In the light of the histories here related we dissent, and take the ground that the fact of his being cured was no reason why it was not a tuberculous case.

There is a great analogy between the morphology of syphilitic and consumptive bloods; also, in the macroscopic lesions. It is, then, not surprising, that such an estimate should be made. But there were no copper-colored spores and filaments in this blood. When both states combine in one individual person, it makes a crowded collection of foreign matters in the blood. Moreover, there are other methods of communicating syphilis than in the natural way, and an open chancre is by no means necessary to the development of the disease.

CASE LVI.—A girl, aged 16 years, Nova Scotia parentage, was run down with chronic cough, expectoration, pallor, weakness, and inability to perform her duties as a pupil of the high school of the place wherein she dwelt. She was no doubt overworked by study; she belonged to a large family. A few years previous a

young sister died of consumption, and her connections were fearful of a similar fate in her case. She was found at home, depressed, countenance, naturally of a tawny color, was pale. Her chest was carefully explored, and presented some crackling râles, inspiratory and diminished resonance on percussion over the upper portion of the left lung. Her blood showed the marked signs of tuberculous disease so often named. She went on to the Salisbury plan of treatment, and also proceeded to Nova Scotia for a change of air. This occurred in 1875. She made a good recovery, which has proven so far permanent, though she went but partially on the diet. This record shows that half a loaf is better than none.

Case LVII.—Miss F. P. C., about 38 years of age, is a sufferer from uterine disease, induced by vaginal impalement on a fence-picket in girlhood. She was troubled with pharyngeal irritation, more or less; but in the spring of 1877 she was particularly harassed by her cough, some expectoration, loss of flesh and strength, and general malaise. At that time there were no physical signs of tuberculous deposit in the lung, but the blood showed marked evidences of the pre-stage. On one occasion it showed a very beautiful triple-stalked mycelial filament which I never observed before. The white corpuscles were enlarged, and the spores abundant. She went on the strict diet with advantage. The cough was diminished; the flesh, strength, and color returned; and the morbid morphological elements were diminished to a great degree. After living strictly for a month or so, she began to wander from her diet list. Still its abandonment did not affect her general condition, only the blood showed its effects, and she has not lost her ground, showing that it was safe for her to vary from the regime. She is watched, and at any signs of giving way will be put on the list again.

Oct. 1879. Her blood and lungs are in good condition.

Case LVIII.—Dec. 13, 1873, Miss E. W. H., a comely woman, school-teacher, presented herself for examination in regard to lung troubles. She had a chronic cough, some expectoration of mucus, paleness, feelings of languor and weariness, with some anxiety as to her condition, as her family was not a healthy one. On examination of the chest, it was found that there was crackling and dulness on percussion at the top of the left lung.

Elsewhere normal. The blood was found to present the phases that have been so often alluded to here. There were no night-sweats; menses scanty; appetite not good. She took some cough medicine, some tonic, and the animal food exclusively, as remedies. Under this regime, not thoroughly carried out, she made a good recovery, all the time teaching a common grammar school. In Oct. 1874, she was disabled from duty by a uterine disease which required her to relinquish her post and give herself up to treatment. At this time the blood and chest symptoms did not appear; she made a good recovery; and not long ago (Dec. 1876) was seen to be in the enjoyment of good health, and industriously exercising herself with the very arduous duties of her profession. 1880, well.

Case LIX.—A naturally nervous man, aged about 50 years, in Feb. 1874, had severe chronic cough, night-sweats, loss of appetite, copious expectoration, diminished resonance and expiratory crackling over the left upper third front of the chest. He was confined to the house, but not to bed, and had been sick for some time. He was thoroughly alarmed and in great distress at his situation. The blood presented undoubted evidence of the presence of tuberculous disease. After some hesitation, chiefly from monetary considerations, he accepted the strict diet and acid baths, and faithfully adhered thereto. He took iodide of potassium and a mild expectorant. The result was marked and prompt; the appetite returned; he ate voraciously; the night-sweats ceased speedily; cough and expectoration diminished. The physical signs improved; the blood cleared up, and finally his health was completely restored and remained so in this respect. He had been a subject of repeated attacks of asthma for many years. At these times the chest all over would be filled with sonorous crying râles. On this occasion there was nothing of the sort. There might have been a mistake of diagnosis, but when one considered the great frequency of tubercle, its latent character, and obscure progress, it does seem *improbable* that the above assemblage of physical and rational signs should be occasioned by anything but consumption. 1880, well.

Case LX.—Irish, 17 years of age, large size, grown up fast, and worked too hard in a grocery store. A year before he had typhoid fever severely, and now he was seized with an acute in-

flammation of the upper lobe of the right lung. There were pain and fever, copious, harassing cough. The chest presented marked dulness, and tubular respiration over the right upper third front. Elsewhere there were more or less bronchitic râles. The dulness was very obstinate, and lasted for several weeks, even after he was well enough to be about and work somewhat. The blood showed signs of tuberculous disease. He adopted the strict diet, and faithfully carried it out, and was finally rewarded by a restoration to full health. This case was a severe test of the diet treatment, as acute tuberculosis at his age has been one of the *opprobria medicorum.*

CASE LXI.—In 1871, Mrs. W. G. C., thin, small sized, but well developed woman, aged about 34 years, complained of a chronic cough, expectoration, not copious, and pain under the shoulder blades. She was the mother of two children. Her own mother was a subject of chronic eczema. Family not regarded as consumptive. She resided in a rather low place, where water could be obtained by digging only a few feet. The physical exploration of the chest showed that there was some, but not very marked, disease. This was indicated by diminished resonance on percussion, and crepitant râles in the upper left side. The blood showed signs of the existence of tubercles. Under treatment, such as has been usually pursued in this series of cases, she entirely recovered, and remained so.

CASE LXII.—Miss Garvin, resident New York City, aged 20 years, in the summer of 1873, came on to Woburn, Massachusetts, to be treated. She had been sick some time, and lost flesh and strength. She had chronic cough, with free expectoration. No blood; night-sweats; pallor; weakness; Irish descent, but American born. The chest showed decided marks of tubercle in the first stages. The blood displayed the evidences of consumption, to which particular attention has so many times been called. She was put upon the baths, strict diet, and a tonic. In a few months she gained fifteen pounds, and returned home very much improved, with a prospect of a permanent cure. At last accounts her health was good, and no return of the disease—1880.

CASE LXIII.—Mrs. S. G. P., came of a consumptive family. In 1871 she was seized with an alarming hæmoptysis. It seems that she had been subject to severe periodical attacks of quinsy,

that had undermined her health. She had a chronic cough, with not much expectoration. There was diminished resonance on percussion over the right upper third front; also, expiratory murmurs, with some crepitation. The throat was not much inflamed, except a small patch, as large as a finger-nail, on the middle of the right posterior pillars of the palate. The blood presented decided evidence of the tubercular state. She adopted a thorough course of application for the throat, also the strict diet, acid baths, and tonics suited to the case; and combined with these a change of air, which resulted in the apparent re-establishment of her health. The blood lost its micrographic tuberculous characters. Lately, August, 1877, after unusual excitement and labors in household affairs, she had a copious hæmoptysis, with crepitation and dulness over the right upper third front. The blood appeared normal. There was increased action and area of dulness about the heart. Rest, quiet, and the regimen have restored matters to their former standing, and she is now quite well, and presents no marked sign of physical lesion. The ambition of this lady leads her to perform tasks beyond her strength. It is easy to overwork, especially when the standard of capacity is one of "feeling well."

Dec. 1878. During the winter Mrs. P. was ill with local disease—pelvic. Her nervous system was very much disturbed; she had pains which were located in the chest, right upper third front; still there were no physical signs that I could detect, save a puerile murmur. This pain proved to be reflex uterine; still, the blood was found to be diseased with spores, and spore collects, mycelial, and fibrin filaments. These were cleared out by diet, so that at the present time they have almost entirely disappeared, and she is quite well, save a late attack of urticaria from eating cheese.

Oct. 1879. Still well.

Sept. 1880. Still well.

Case LXIV.—Miss P., 17 years of age, a boarding-school girl, came home in 1875 on account of a severe hæmoptysis. She had grown up fast, coughed much, raised considerable sputa, and was confined to her bed for the most part. Physical exploration of the chest did not reveal strongly marked disease of the lungs. The heart was beating normally, except its increased impulse. The blood was unusually full of fibrin and mycelial filaments,

of spore collects and of spores, many of which were very actively in motion, and also were of a decided copper hue. Some of the mycelial filaments were of a copper hue. Diagnosis—tubercle and syphilis. Under the treatment so often named she recovered her health perfectly, and apparently remains so now, 1878.

PRETUBERCULAR CASES TREATED THAT MAY COME UNDER THIS HEAD.

CASE LXV.—In April, 1876, a young man of 18½ years complained of feeling weak and listless. He had nocturnal and morning cough with slight expectoration. He was pale, thin, and loosing flesh and strength. Consumption was hereditary in his father's family. There were no physical signs of pulmonic lesion.

Inspection of the blood microscopically disclosed abundant signs of mischief, such as—

Fibrin filaments very marked in character.

Spores and spore collections.

Vegetative filaments.

White corpuscles much enlarged and too numerous.

Red corpuscles thin, flabby, pale, sticky, outlines not clearly cut—aggregated.

These taken together, with the history and the rational signs, induced a diagnosis of the pretubercular stage.

Under the use of acid baths and strict diet the sanguineous and other signs began to disappear, so that in a year he was enabled to proceed to Germany to study music. 1879 is still well.

CASE LXVI.—May 1, 1877, S. L., physician, Springfield, Mass., aged 45 years. Father had consumption in his youth, but recovered, and lives in good health at the age of 70 years. A sister died of the same disease aged 43 years.

He complains—

Of taking cold easily on any exposure.

Of ulcerated sore throat.

Of feeling weak and debilitated.

Of loss of flesh.

Of cough and expectoration.

Of a nervous irritability that enables him to feel his lungs; and

Of such general malaise that he has left home on account of his health.

Physical exploration of chest shows a slight diminished resonance on percussion, diminished inspiratory murmur, strong expiratory murmur, no râles at the upper part of the right side. Otherwise the signs were normal, except, perhaps, as he himself suggested, there is increased communication of the carotid arterial murmur over the right thorax rather than the left. Heart normal.

5 P. M. The blood showed numerous spores in active motion, large masses of spores, enlarged white corpuscles, fibrin filaments, no mycelial filaments. The red corpuscles were not very pale, but were well defined, distinct, and somewhat in rouleaux.

Diagnosis.—Pretuberculosis.

9 P. M. The blood had large interspaces crowded with most actively moving spores—the motion was the most marked the writer ever witnessed in blood. In some places the spores were double.

May 2d, 10.15 A. M. 17 hours and 15 minutes after they were removed from the systemic blood streams, the spores were still actively running. The strict diet and acid baths were adopted as a mode of treatment.

June 23d. He writes: "I have been steadily improving in general health and strength. Nitrate of silver, grs. x–℥j glycerine, relieved the throat. I have now no chest symptoms whatever, and my strength is improving."

Nov. 3d. Seen in person. Has not strictly lived on the diet since he was better. The spores and collects were present, but in less amount. The fibrin and mycelial filaments were marked. Chest symptoms disappeared. The importance of adhering to the diet was insisted upon anew. If he had done so his blood would have been better in appearance. Still he was personally very well satisfied and encouraged.

April, 1878. Much better every way.

Sept. 1880. Well.

Case LXVII.—A man aged about 24 years took a severe cold in the spring of 1876. His cough was troublesome. Expectoration not copious. He had lost voice, flesh, and strength. He was pale, anæmic, not robust. His father died of consumption. He had a sister in the last stages of the same disease, who died subsequently to the period of which mention is made.

There were no physical signs of lesion in the lungs.

Inspection with laryngoscope revealed a reddened and thickened condition of the vocal cords and larynx.

Inspection of the blood with the microscope showed fibrin filaments abundant and marked. Spores and spore collections numerous and large. Vegetative filaments.

White corpuscles too numerous for health and enlarged. Red corpuscles thin, sticky, flabby, pale, outlines not clearly cut—aggregated.

It was the most characteristic case of pretuberculosis it has been my lot to examine. Treatment was instituted upon this base of diagnosis. In a short time its benefits were shown by the clearing out of the morbid elements from the blood in a great measure. The voice, strength, and flesh were restored. The larynx appeared healthy under direct inspection. Eighteen months later he presented the rational signs of good health, and but slight tokens of disease in the blood.

Chest signs normal.

Case LXVIII.—April 26, 1877, Miss B., school-teacher, aged 24 years, consulted the writer in relation to some enlarged lymphatic glands that disfigured the right side of her neck. She had some cough; phthisis was hereditary in her family. There was some disturbance of the nervous system, owing to a uterine displacement. Physical signs revealed a diminished respiratory murmur throughout the right lung. No dulness or diminished resonance on percussion. Inspection of the blood showed the morphological elements of tuberculosis. She was placed upon a diet of milk especially.

August 3, 1877. Blood cleared up; respiratory murmur normal. Physical development improved; cervical lymphatic glands considerably diminished; some neuralgia still; general health restored.

September. She resumed teaching, and has continued well up to last accounts. This patient displayed a mind of rare firmness of character, and heroically pursued her course of diet though surrounded by adverse influences. It has been often noticed that the success in the diet treatment depends much upon psychological foundations, to wit, a firm and steady purpose. The cervical glands at last sight were very much diminished, so as to be hardly perceptible. Dr. Salisbury has treated many such cases with similar success.

CASE LXIX.—Mrs. C.; April 1, 1877; age 30 years; Irish; four children; the youngest ten months old. Since Jan. 1, 1877, she had suffered from uterine hemorrhages, and had lost color, flesh, and strength; appetite almost gone; for about two weeks she had been confined to bed; temperature 100° to 102°; cough; no physical signs of trouble with her chest; diarrhœa. Her blood presented spores, spore collects, mycelial filaments, no fibrin filaments. White corpuscles enlarged, but not too numerous. A fibroid tumor, of the size of one's fist, was attached to the posterior part of the uterus. She was put on the strict diet with a surprising result. In twenty-six days the tumor had entirely disappeared. The morphology of the blood was restored to health. General health entirely restored and remains so.

Remarks.—This is history; still, too much must not be made of it. It astonished me. Some might object to its recital here; but in a relation of facts what right have we to reject evidence simply because it does not tally with our previous notions? The writer has freely put forth the unfavorable side of these histories. Why not give the *favorable* side an equal prominence?

CASE LXX.—Dec. 5, 1877. Miss C. W.; 21 years old; Nova Scotia parentage; house-servant; had been sick four weeks with a severe cold and cough of which she was now better. She was of large size, countenance pallid and pasty, movements impaired, although she was able to perform some labor. She stated that her father's family was consumptive and rheumatic. She complained of hemorrhage from the nose, menorrhagia, headache, numbness in limbs, especially in the hands, and dyspnœa on exertion. She felt she was running down rapidly. A physical exploration of the chest showed nothing abnormal save a feeble respiration over the right side of the chest. Heart's impulse and area of dulness increased; sounds normal. The uterus was anteverted. The blood was filled with spores, mycelial and fibrin filaments. White corpuscles numerous and enlarged; red corpuscles good color, segregated, distinct.

Diagnosis.—Pretuberculosis.

Treatment.—Pyrophosphate of iron; strict diet; rest from labor.

Remarks.—It appeared that since coming from home she had eaten largely and freely of sugars in all forms. She recovered entirely.

In conclusion, the writer refers again to the article in the September *Virginia Medical Monthly.*

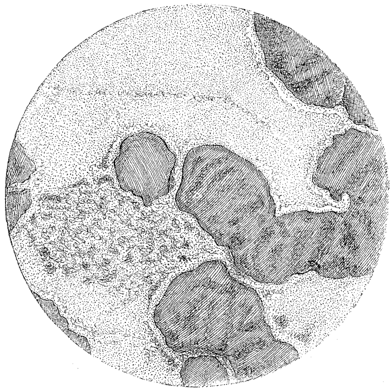
Let them who wish to test the Salisbury plan stick to his text. The use of the microscope is invaluable in telling at once if the patient has wandered from the diet. No questions need be asked, the field under the objective tells the whole story. No one who attempts the diagnosis and treatment of consumption can afford to dispense with the use of the microscope. To aid such the writer has published a Primer of the Clinical Microscope. He also means to aid in the promulgation of the Salisbury plan in every way possible. Remember that Dr. Salisbury has shown the synthesis of consumption by feeding only, and verified it by 104 autopsies. In this he stands alone. The profession should accord him a fair hearing, as the subject is the most momentous one a physician has to deal with in the treatment of disease.

APPENDIX A.

When these cases were treated, use was made of a diet list—called strict diet—which I made, based on conversations with Dr. Salisbury. Now that he has given his treatment, my list is unnecessary.

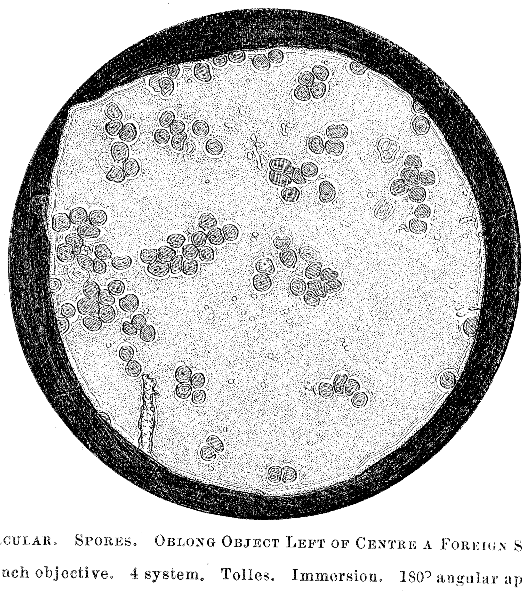
SALISBURY MORPHOLOGY OF CONSUMPTIVE BLOOD, FROM MICRO-PHOTOGRAPHS TAKEN BY EPHRAIM CUTTER AND G. B. HARRIMAN.

PLATE I.



SPORE COLLECT. FIBRIN FILAMENTS.

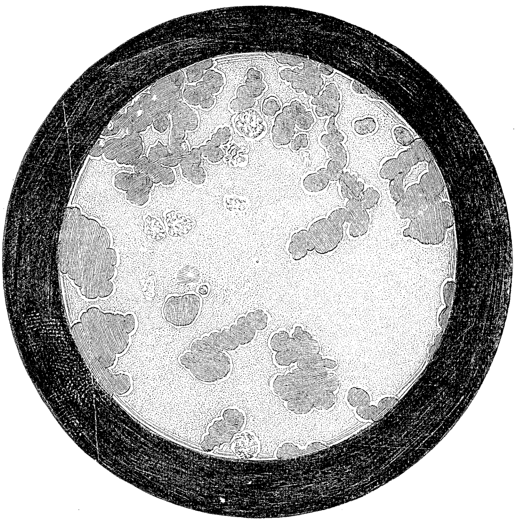
1450 diameters. 1-50th inch objective. Tolles. Immersion.



PRETUBERCULAR. SPORES. OBLONG OBJECT LEFT OF CENTRE A FOREIGN SUBSTANCE.

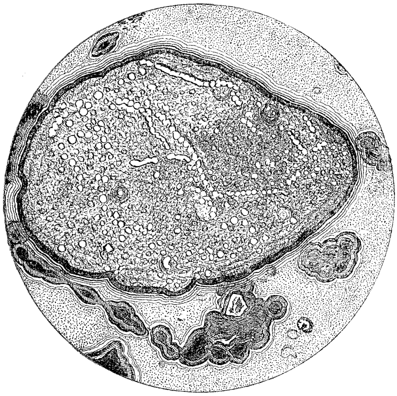
1-10th inch objective. 4 system. Tolles. Immersion. 180° angular aperture.

PLATE II.



ENLARGED WHITE CORPUSCLES. SPORE AND SPORE COLLECTS. MASSED RED CORPUSCLES.

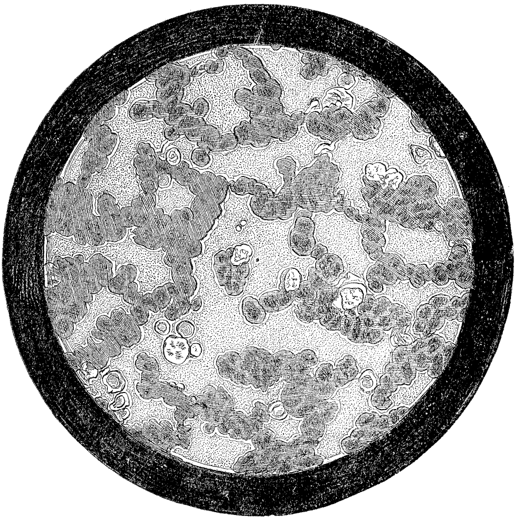
1-10th inch objective. Tolles. 4 system. Immersion. 180° angular aperture.



DRY MYCELIAL FILAMENTS TRAVERSING VACUOLE. SPORES. WHITE CORPUSCLE. RED CORPUSCLES, MASSED, DRAWN OUT, STICKY.

1-10th inch objective. 4 system. Tolles. Immersion. 180° angular aperture.

PLATE III.



Enlarged White Corpuscles. Spores. Spore Masses. Artist gives Red Corpuscles too Distinct.

1-10th inch objective. Tolles. 4 system. Immersion. 180° angular aperture.

Mycelial Filament. Spore. Red Corpuscles Characteristically Massed and Confusedly Aggregated.

1-16th inch. Tolles. 3 system. Immersion.

RESTORATIVES.

By J. R. UHLER, M.D.,

MARYLAND.

THE present may be described as the time of animal chemistry and for close imitations of nature secured by restorative remedies.

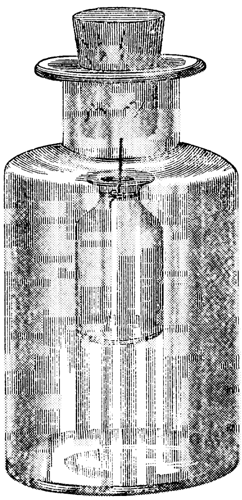
Restoratives are substances that supply to the system either pabulum or energy. They are naturally divided into foods proper, food preparers or ferments, and medicines; and belong either to the vegetable, animal, or mineral kingdom. Their actions are as various as their names; some building up the tissues almost mechanically, others only by putting energy into them. In systematic treatises, they are classed as foods, tonics, stimulants, ferments, nitrogenous, oily and sugary substances; but we prefer to call them restoratives simply because they can restore. Many have been in use since the earliest times, but restorative medicine proper owes its origin to the reaction against depletion and to the clinical observations of Drs. Todd, Bennett, Chambers, and a host of others. Like most other systems, it has had a struggle, but at present there is more danger from too ready acceptance and over-estimation than opposition.

Before restoratives can be properly used, we must be sure they are needed, and have some idea of the quantity. To secure this information, careful study of each individual case is required, and a knowledge of what the average man uses as food. The individual himself depends upon hunger and the feeling of satisfaction, due partly to the distension of the stomach, to regulate the quantity of aliment; but the comparative anatomist looks to the teeth and size of the organs, and speaks with more authority. The results of his observations seem to teach that the young require more nitrogenized material in proportion to their sizes than adults, and that the latter in their diet tables use more meat than the teeth call for. The physiologist and physician decide by more difficult and exact methods, such as

observation and analysis of milk, nature's own food, and of the income and outgo from the body, as shown by the secretions, excretions, etc. No random efforts will avail here, but systematic examinations of everything are required. Calibration of the stomach is essential to see if it will contain enough to keep up the man-power of the system, and test-trials of the digestive fluids are equally requisite. The average constitution of the human body also affords indications of what is needed to build up its various structures, since we know it is composed of so much water, nitrogenous, oily, and bony tissues, and have it in our power, through dilution and the microscope, to accurately count the number of the blood-globules, and determine the constituents of fluids. All this requires work, but not so much as formerly; and as more demands are made upon the chemist for clinical aids, simple and quick methods will be provided. Already a number of workers have taken the field, and present as the result many improvements.

Prof. Flint has praised Davy's plan for the clinical determination of urea, and another has been devised by two English chemists that is quite ingenious. They are somewhat unpleasant, and may soil the fingers on account of the mercurial or water bath that is essential, and this consideration has induced me to suggest several others. I do not wish at present to express any opinion upon their relative merits, but where a person possesses a sensitive balance, the one (Fig. 1) that I shall now mention

Fig. 1.

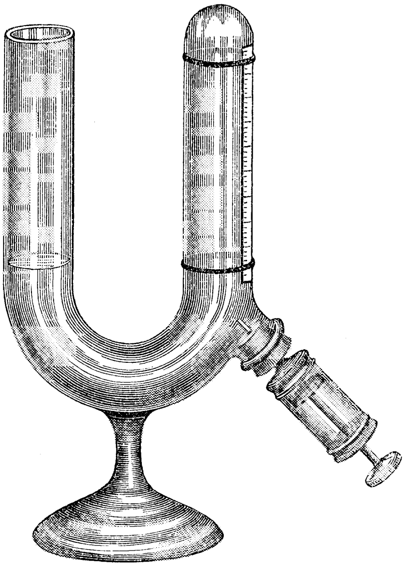


seems the most perfect. It depends upon weighing the nitrogen in combination, and then the other substances left after its decomposition and escape. It may be denominated the plan of double weighing or the method of differences—and where proper precautions are taken, is simple, cleanly, and quite accurate. The operation is performed in a bottle, the neck of which is large enough to admit a drachm or larger vial attached to the bottom of a cork by string or wire. The small vial is intended to be placed uncorked in the larger one, and to contain a measured quantity of urine. The larger bottle holds the tests, which are either Labarraque's solution and solution of salt or hypobromate of soda solution. When we desire to make a determination the larger bottle is half filled with the test fluid (for rapidity the hypobromate of soda is preferred), and the small one with a measured quantity of urine. The small vial suspended from the cork is now carefully thrust into the neck of the other bottle, so as not to spill its contents, and the cork is pressed tightly into place. The whole is then carefully weighed, the amount noted, and the bottle turned upside down and shaken, so as to mingle the contents. After, or even before, complete decomposition, if the pressure be great, and to insure accuracy, the cork must be slightly removed, and when all the gas has escaped, provided decomposition is over, it is to be reweighed, and the difference between the two will represent the weight of the escaped nitrogen.

The weight of this gas being known, the quantity of urea can at once be calculated from a table. Another method, called the specific gravity one, depends upon the property of pure sulphate of lime (that has been washed with absolute alcohol) to form a solid with water or urine. This solid is then to be powdered, and its urea dissolved out by absolute alcohol, when the specific gravity apparatus will give us the amount of urea contaminated with a slight quantity of extractive, or the alcohol may be allowed to evaporate spontaneously, and the urea can then be directly weighed. For those who have no scales, I have devised other simple forms of apparatus, such as the U tube, to contain mercury salt and water, with Labarraque to decompose the urine, which is brought in contact with it by a hypodermic syringe inserted through a cork at the bottom or top, or a float bottle to contain the urine may be used for the same purpose. The nitrogen that collects in the upper part of the apparatus

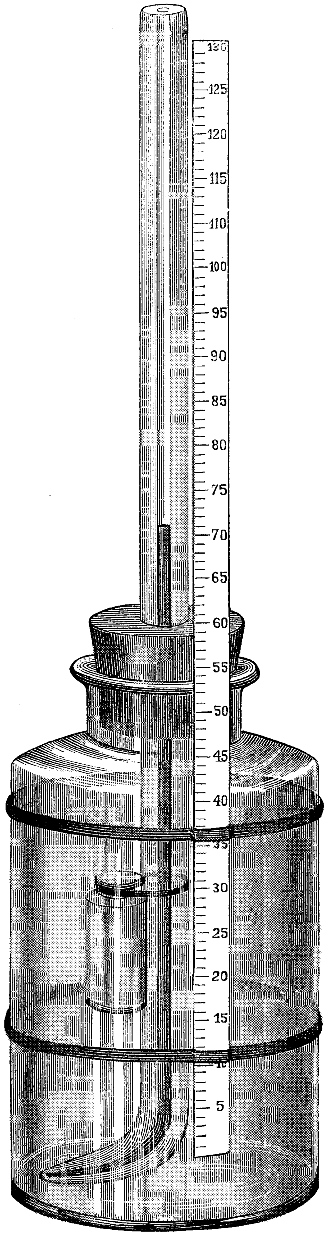
(Fig. 2), can be directly measured by the graduation upon it. In another form a mercurial column in a manometer tube is

Fig. 2.



directly acted upon by the pressure of the nitrogen, as it is disengaged by the chlorinated soda in the bottle, and the quantity can be told at a glance (Fig. 3). The urine in this case may be introduced through the manometer tube by means of a piston, by a float bottle inserted before the cork that contains the manometer tube is placed in position, by spun glass used as an absorbent for the urine that can be stuck round the tube and afterwards be shaken off, or by attaching a small bottle to the manometer tube, as had previously been done when the first or double weighing process was described. With the latter method, the bottle and manometer has to be turned on its side or upside down, so as to mingle the urine with the tests, and one end of the manometer tube will then have to be closed by the finger, or an India-rubber stopper, or one of the rubber caps that are met with on the common drop tube. I have tried a number of other modifications that are well worthy of mention, but time forbids their description. Other secretions or excretions can be examined by like simple tests, so as to obtain a very fair idea of the wantsof the whole body.

Fig. 3.



The quantity of a remedy that is required can only be determined by what is known concerning its average effects, and depends upon the condition of the absorbents or pores of the sys-

tem at any given time. Thus, if we have reason to think that the natural pores are stopped up, or reduced in calibre, or obliterated, it is useless to present substances that are too large to enter them, and if such remedies are essential they will either have to be reduced in size, or, if this is impossible, a new route by the rectum, or hypodermic syringe will have to be chosen. The special preparation, that both foods and medicines require, has been left too much in the hands of the cooks and druggists, but it is wonderful to note how mankind has been led to act physiologically without such intention. In the choice of food used in the raw state, if Dr. Roberts is to be credited, but two animal substances are suitable to be thus employed, and these are milk and oysters. The first has been specially prepared by the animal economy, and is looked upon as the ideal food, and the second contains within its liver the two substances, glycogen and a ferment that when mingled are requisite for its digestion. A proof that the oyster possesses this power has lately come under my own observation, which may be worthy of description. A gentleman, who had suffered for three years from a small quantity of sugar in the urine, due to slight brain trouble that caused temporary paralysis, informed me last winter that whenever he ate raw oysters the specific gravity of his urine increased from about 1013 to 1028. Anxious to see if this was not a mere coincidence he was directed to refrain from the use of the bivalve, except on four special occasions at an interval of three days, when, sure enough, the specific gravity and sugar both increased in such proportion as to leave no possible doubt.

I should like very much, if time permitted, to call attention to some experiments that I have made upon porosity, endosmose, etc., by various physical means, especially the spectroscope, and to speak of the modifications that occur to foods or medicines from dilution, digestion outside the body, cooking, Papin's digester, etc.; but for the present must be content to refer to improvements of flavor. The importance of this subject can hardly be overestimated, since it is the key to gain access to many a disgusted stomach, and on which turns much of our success as practitioners.

The most difficult substances in our experience to improve belong to the class of fats or oils, and many have been the attempts to render them tolerable to palate and stomach. The most successful depend upon overwhelming the sense of taste

by highly pungent or aromatic oils, or by dilution so as to scatter the particles, in hope that the tongue will come in contact with but few of them. Another plan has been to emulsify, so as to mechanically cover over each globule, or mingle with some solid like that from which the oil was originally taken. Cod-liver oil, one of the best restoratives, has thus been prepared, and in the form of jelly, emulsion, soapy material, glyceroid, liquor, in capsules, etc., has long engaged attention. It has lately been used in combination with beer, phosphates, glucose, and dextrine, as put up by Dukehart in our city, where the bitter of the hops and sweet of the maltose render it quite agreeable to many palates and stomachs. A keen sense of taste, however, can often detect it, and where the flavor is entirely to be disguised it is absolutely necessary to adopt some other plan. Cheese affords an excellent vehicle for those who are fond of it, as it not only covers the taste, but by its pungency acts upon the oil so as to put it in the most favorable condition to be emulsified and digested. Where cheese is objectionable bread may be substituted, or it can be disguised by the vinegar, salt, and spices of a salad, substituting this for salad oil. It can also be added to the codfish balls consisting of fish and potatoes, so commonly eaten in New England. The taste of other unpleasant restoratives may be modified in a similar manner by using something pleasant that they most nearly resemble. One important object accomplished by rendering the flavor pleasant is to keep the substance for a longer time in the mouth, so as to enable it to be disintegrated and mingled with the saliva. Because the saliva has no chemical or fermentive action upon certain classes of remedies, is no reason that it is not useful, for there are two other mechanical effects that are very essential, namely, a rending asunder of particles from the carbonic acid that is generated from the carbonates when the food reaches the stomach, and an expansion of the air from heat that is held in meshes by this viscid fluid. The power of the saliva, both as a solvent, diluent, separator, etc., is not half appreciated, even by physiologists, otherwise there would not be the indifference that is daily seen concerning its quantity, constitution, reaction, and specific gravity. In the infant, for instance, of but a few weeks, who has no starch to digest, what is the use of the abundant supply of this fluid we sometimes see? Does it not at times even do harm and call for some remedy like belladonna to check its secre-

tion that from superabundance keeps up diarrhœa? It is only of late that we have noticed the importance of this subject and have commenced to supply artificially a substitute for the deficient ptyalin of this important secretion.

Dr. Roberts, of Manchester, in a series of thoughtful articles in the *British Medical Journal*, and Mr. Dukehart, of Baltimore, have both lately investigated the subject of the digestive ferments, the first as a scientific physician, the second as a practical observer, on a large scale, in a brewery. The work of the former gentleman was, probably, a labor of love; the second, due to a providence, or combination of circumstances, called an accident, that compelled the thought and action that follows. Nearly four years ago, on brewing day, the boilers gave out, so as to compel a postponement, and, in consequence, many dairymen could not obtain their usual supply of grains, the residue of the process. Among these was a wealthy farmer, who seemed greatly chagrined; and when asked why he did not turn the cattle into his beautiful meadows, replied, that if he did, he would lose from the want of the grain fifteen per cent. in the yield of milk. It happened shortly afterward that the wife of a friend was confined, and it was mentioned that the mother had not sufficient milk to nourish the infant. Reflection upon what the farmer had said induced a trial of the effect of some pure malt extract, which was prepared for the purpose, and gave the most complete satisfaction. Since that time, the extract of malt and hops, or glucose and dextrine, as he calls it, has been improved and prepared upon a large scale in the following manner. Malted barley is ground and placed on a perforated diaphragm in a mash tub, and water of 158° F., or less, run on, thoroughly mixed, and allowed to remain in contact with it for one and a half hours. At first the temperature slightly rises, but afterwards falls to 154° F., or less, when the liquor is withdrawn and concentrated in vacuo, until the saccharometer registers 26. Hops are now added, and after their virtues are extracted, the liquid is strained, and again concentrated in vacuo. The final step is the addition of sufficient glycerine to prevent fermentation, a formidable obstacle when the manufacture was first commenced. Medical men who have largely used it, speak very favorably of its action, and as it is among the few remedies of the kind that are presented in the fluid or soluble condition, and as it contains no alcohol, it seems every way worthy

of extensive trial. Its power to convert starch, when properly prepared, into maltose, is very great, as I have proved by frequent experiments. In the market, it is offered in various combinations, such as citrate of iron and quinine, glucose and dextrine, with hypophosphates, malt wine and iron, cod-liver oil, extract of malt with hypophosphates of lime, etc. It would be useless to attempt to mention all the names of the various restoratives, but I cannot leave the subject without drawing attention to some of the defects of the ferments, especially pepsin, and saying a few words concerning our old friends, digitalis and iron. Many who have used pepsin in various forms, have been frequently disappointed at the negative results, and have become skeptical about it, as usually obtained. Some also have observed irritating effects and unpleasant odors that produced nausea and vomiting. To settle these questions, I have tested various preparations, both fresh and stale, in the following manner. A weighed quantity has been dissolved in half a drachm of very dilute muriatic or lactic acid, and this fluid, with a known quantity of coagulated white of egg, cut into uniform pieces of small size, has been placed in a drachm homœopathic vial, and tightly corked. A strong cord is now attached to its neck, and the vial thrust into the rectum, with the string protruding. It is thus placed, as nearly as possible, under natural conditions of temperature and peristaltic shaking that occurs as we walk. At the end of one, two, three, and four hours, it is withdrawn to watch the effect, and if none is observable at the termination of the longest period, the specimen is considered practically useless. Microscopic examination reveals the fact that numerous specimens in the market are of very different characters, and a thorough investigation of them, under many different circumstances, is very urgently needed.

A multitude of experiments, conducted in both ways, has convinced me that fresh material is the only kind to be relied upon, and I have obtained better effects from the watery or dilute wine extract of the stomach, than in any other manner. Dr. Roberts, who has investigated this subject very extensively, prefers dilute alcohol, to prevent spoiling, but mentions solutions of boracic acid and chloroform water as also effective. Lately, I have thought of a plan of preparation for both the stomach and pancreas, that promises to be of assistance, to reduce it from the semi-liquid to the solid or powdery condition, and thus

contribute to its preservation. It depends upon a principle before announced, when speaking of urea, by means of which we are enabled to evaporate to dryness, or dehydrate without production of elevated temperature. The substance employed is fine plaster of Paris, which is added to the chopped-up lining membrane of the stomach or to the pancreas, allowed to stiffen, and afterward powdered. When it is desired to be used, the active part can be extracted by water, which dissolves but little of the lime. A small quantity of sand may be of assistance to help the disintegration, but as promptness is the chief object, a plenty of powdered plaster ought to be used to solidify it immediately. How long it will thus keep during hot weather, I am not able to say, but am now testing the question. The action of iron is so generally admitted as a restorer of blood-globules that, if it were not for an occasional failure, I should not mention it; but when we reflect upon the cause of this failure, or what seems to be the cause, a very important subject at once comes before us. It is apparent to all who have given much attention to physics, that nature is full of circular motion; from the flow of the sap to the movements of fluid in the largest vertebrate they are all more or less circular. This seems to be a natural effect due to residence upon a planet, that is, a globe, and revolves in an ellipsoidal manner around a centre, which is also circular. Everything upon this planet, from the lowest to the highest, is subject to attraction, pulling in two or more directions, and the outcome of this is growth as a spiral wedge. A beautiful example of one of the forms produced by these motions is seen upon a large scale in the planet Saturn, with its rings; and in a small one, it seems to me, in some floating blood-corpuscles. That they were both produced by the same kind of motion seems evident from a study of the vortex motions enunciated by Sir Wm. Thompson, and made evident by the rings that occur when a drum-head is struck that is stretched over a box with a round aperture, said box containing muriate of ammonia in vapor.

The so-called centrifugal force apparatus also gives an example of the same in liquids, and the smoker's rings and those from the locomotive are familiar to all. Now, the heart in its action, as can be seen from its fibres (Fig. 4), pulsates or twirls round from left to right in a spiral, and this motion, once impressed upon its contents, continues until it is lost by friction on the sides of the small arteries or in the capillaries. The motions

that any particle sent forth from this organ has impressed upon it are, 1st, in a straightforward direction in the course of the artery; 2d, a spiral one not completely at right angles to it, so that the outcome of the forces will be the resultant of unequal energies, and produce a motion that can almost be called centri-

Fig. 4.

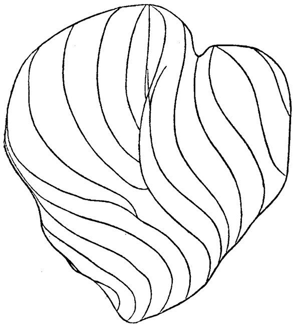
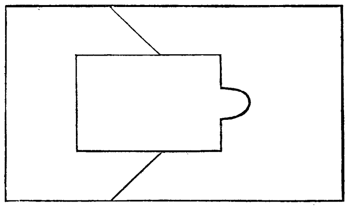


Fig. 5.



fugal, a flattened discoidal one, but which really resembles the vortex motion of Sir Wm. Thompson. Observation of the rings produced in air and water shows a very close resemblance to our human blood-corpuscles, with this exception, that the centre of a corpuscle contains a thin continuity or film of structure, occupying all the space within the circle, giving it the discoidal shape it presents under the microscope. It is true, that this shape can also be impressed upon particles in the bloodvessels in another manner than by sudden growth at the heart, but the same kind of motion is requisite, and it is quite probable that the red corpuscles, whose origin has so long been a mystery, are produced in both ways. At any rate, if you will but consider that each white corpuscle is nothing more than a small projectile, moving from the heart, as from a revolving mortar, and, besides this, a minature of the concussion shell that explodes from inertia (Fig. 5), the cell proper being the outer case, and the nucleus or granules the inner, I think you will be prepared to admit with me, that just such rupture of the cell wall does at times take place, setting free a nucleus with vortex motion impressed upon it, and, perhaps, bent in by contact that occurred at the time of impact. If Bennett's, Wharton Jones's and Huxley's views are correct, that the nucleus becomes a red corpuscle, and if this nucleus be of such a size when circular as to exactly acquire the dimensions of the red blood-corpuscle when flattened

out or compressed; if, moreover, the number of red blood-corpuscles to those of the white be in a certain proportion to the heart beats, which seems probable, and if anæmia be a common accompaniment of heart trouble, I think I have made a cumulative argument in favor of their being thus produced. At how many places this may happen I am not prepared at present to say, but everything looks as if the lungs and liver capillaries, and other small capillaries, might be the principal situations. In favor of this view is the fact that red corpuscles are more abundant in the capillaries and veins than the arteries. That white cells do rupture is certain, and that the force is sufficient to produce the effect is also plain, from the analogies of churning practised by some barbarous tribes who successfully use a leathern bottle that sways to and fro from a stake driven into the ground. I do not at present assert that all blood-corpuscles are thus produced, because some are found before any heart-beats to cause them, but this fact is certain, that whatever debilitates the heart will produce anæmia, and one of Bennett's cases of leucocythemia had an extremely feeble and very small heart. If these views are correct, tincture of digitalis is essential, besides iron, in all cases of anæmia to increase the energies of the heart, to make and circulate blood-corpuscles, and clinical experience seems to further confirm it. Horseback exercise (or that of the flying horse) ought also to be useful. The laws of fluid motion are so difficult, that we may well hesitate to express positive opinions, but unless some other force intervenes to change the motion, the physical laws of particles, that have briefly been stated, will here hold good. It is too soon to estimate the effect of discussion upon these remarks, since some factor may have been forgotten or undervalued that would make a difference, but if discussion shall lead to more careful comparative study of the motions and shapes of hearts, their orifices and the materials that pass through them, this effort will not be in vain. In conclusion, let me state that Harvey, when he discovered what is termed the circulation of the blood, little dreamed of a wheel within a wheel, and that out of said circle would come another from the explosion he so beautifully describes denominated the red corpuscle.

MINUTES OF THE SECTION

ON

STATE MEDICINE.

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ON

STATE MEDICINE.

TUESDAY, June 1.

THE Section was called to order by the Chairman at 2.15 P. M.

The first paper, by Dr. C. R. DRYSDALE, of London, Eng., on the *Death Rate of the Rich and the Poor*, was read by the Secretary, in the absence of the author.

On motion, the paper was accepted and referred to the Association with a request that it be published.

The next paper, on the *National Board of Health*, was read by the author, Dr. J. S. BILLINGS, U. S. A.

It was moved and seconded that the paper be accepted and referred to the Association with a request that it be published.

Dr. A. N. BELL, New York, moved that a committee of three be appointed by the Chairman to carry out the recommendations contained in Dr. BILLINGS's paper.

Dr. T. ANTISELL, of D. C., suggested that the question be divided, and that the motion as to the acceptance of the paper be acted upon first.

Dr. A. JACOBI, of New York, suggested that Dr. BILLINGS had recommended that a committee be appointed from the Section to report to the Association.

Dr. BILLINGS, in reply, said that he had so recommended.

The question on accepting the paper being put, it was so ordered.

The motion for the appointment of a committee of three to consider the propositions contained in Dr. Billings's paper was also carried.

The next paper, on *The Relations of the Medical and Legal Professions to Criminal Abortion*, was read by the author, Dr. E. H. PARKER, of New York. The following resolutions were contained in the paper:—

1. Abortion should never be brought on by the use of medicinal or instrumental means unless necessary to the safety of the mother in consequence of pathological complications.

2. The destruction of the fœtus in utero for any other reasons ranks with other forms of murder.

3. Abortion produced artificially always places the mother's life in jeopardy and thus becomes a double crime.

4. The severest punishment of the operator, when possible, without any probability of executive clemency, is due in justice to the honorable members of the medical profession, and yet more to the community at large.

It was moved and seconded that the paper be accepted and referred to the Association, with a request for publication.

Dr. W. G. Stevenson, of New York, suggested that the first resolution should be so modified that abortion would be lawful when it was necessary to save the life of the child. He also said in substance that he did not consider that the resolutions were called for, as the laws were sufficiently explicit in this and other States.

Dr. Antisell, of D. C., simply reiterated Dr. S.'s statements.

Dr. T. O. Edwards, of West Virginia, said that the law was substantially the same in his State, and in consequence the resolutions had already been adopted. In West Virginia abortion is considered a felony unless it is performed after consultation of three physicians. He does not think that the law could be any stronger on the subject.

Dr. Parker, in reply, said that he merely offered the resolutions wishing to exert the moral force they would carry with them, and thus strengthen those who were weak-kneed.

Dr. Stevenson again suggested that the first clause should be amended so that it would be lawful to produce abortion when necessary to save the life of the child.

Dr. J. M. Toner, of D. C., moved that the resolutions be laid on the table.

The motion to accept the paper and refer it to the Association with a request that it be published, was carried.

The motion to lay the resolutions on the table was carried by a rising vote.

At this stage of the proceedings the Chairman appointed Drs. A. N. Bell, of New York, Thomas Antisell, of D. C., and

E. M. MOORE, of New York, a committee to consider the propositions contained in Dr. Billings's paper.

The next paper, on *Unsanitary Engineering and Architecture*, was read by the author, Dr. A. N. BELL, of New York.

On motion, it was resolved to accept the paper and refer it to the Association with a request that it be published.

Dr. ANTISELL thought it would have been well if the paper had contained a recommendation that it would be considered a penal offence if buildings were not constructed in accordance with certain specified regulations.

Dr. D. B. WHITNEY, of New York, in the course of some remarks, cited a case of defective drainage where a privy and stable were in the vicinity of a well, and where typhoid fever had not occurred in over twenty-seven years. He deprecated the formation of State Boards of Health as an unnecessary expense, and said that the mortality was less in former years, when there was not so much known as to sanitary science.

Dr. MEAD, of Pennsylvania, in reply, said that negative facts proved but little, and that one positive fact was worth fifty negative. He cited a case in which a drug store caught on fire; there were two wells, one in close proximity to the store, the other separated from it by an intervening street and a row of buildings, yet in a very short time the farther well was impregnated with the drugs, although there was no communication between the two. The speaker regretted that he had not brought the notes in reference to the subject with him.

Dr. WHITNEY thought that we were at present crowding sanitary matters to too great an extent.

Dr. E. M. MOORE, of New York, supported Dr. Bell's views, and spoke of the obstinacy and ignorance of the majority of architects. He also asked Dr. Bell how a cellar should be built in accordance with sanitary principles.

Dr. HIBBERD, the Chairman, asked why the carbonic acid gas was prone to circulate in cellars, when it was so much heavier than ordinary air.

Dr. STEVENSON asked for information as to why, in some instances, illuminating gas contaminated the air to such an extent in some cases. Was it because of poor plumbing, or deficient sewage?

Dr. BELL closed the discussion by describing the manner in which cellars should be made. He advocates the use of coal tar

and creasote applied to the floors in layers and sprinkling sand over this. Side walls may be treated in the same manner. Another plan was to put the bricks in tar, and when very porous they would absorb a considerable quantity of it. A discussion also ensued on the desirability of having separate systems of drainage, one for sewage materials, and the other for water.

On motion, the Section adjourned at 4.50 P. M.

WEDNESDAY, June 2.

The Section was called to order by the Chairman at 2.20 P. M.

Dr. A. N. BELL, chairman of committee to consider the recommendations of Dr. Billings's paper, read at first day's session, made the following report:—

Whereas, It is of great importance in medico-statistical work that a uniform system of nomenclature should be employed, and

Whereas, At a Convention of Registers of Vital Statistics convened at Washington on the 6th of May last, a committee was appointed to confer with the Royal College of Physicians of London with reference to the decennial revision of the Nomenclature published by that Society, and with the view of obtaining such additions to or changes in said nomenclature as will make it satisfactory for the use of the vital statisticians of all English speaking people—

Therefore, *Resolved*, 1. That the American Medical Association cordially approve of this effort to secure a satisfactory and uniform nomenclature:

2. That there shall be appointed by the President a committee of (five) to confer with the committee appointed by the Convention above referred to, with reference to the additions to and changes in the Nomenclature of the Royal College of Physicians of London which are desirable to make it suitable for use by American physicians, and to co-operate with said committee in securing such additions and changes.

A. N. BELL,
E. M. MOORE,
THOMAS ANTISELL.

Dr. A. CLENDENNIN, of New Jersey, offered the following resolution.[1] The proposed act was then read.

It was moved and seconded that it be adopted by the Section.

Dr. A. H. CARROLL, of New York, said that the proposed Board would be too cumbrous, and there were strong objections to it, on the ground of its constitutionality. He moved a resolution as follows: That it was inopportune on the part of the

[1] These minutes are printed as furnished.—PERMANENT SECRETARY.

Section to approve of the proposal, and that the present National Board of Health answered all purposes.

Dr. Edwards, of West Virginia, offered the following resolution as an amendment, which was accepted by Dr. Carroll.

Resolved, That this Section return to the Association the bill to amend an Act, etc., referred to it by the Association, with the following action:—

I. The bill in question is deemed impracticable and unadvisable.

II. It is believed that the present organization of the National Board of Health is entirely satisfactory, and that no change in it is recommended.

Dr. Billings, U. S. Army, spoke of the present organization as the best that could be obtained, and said that the trouble already was as to amount of money expended.

Dr. Clendennin spoke of the opposition to the present Board, and said that no more power was given to the organization proposed by him. As to the expenditure, that objection was not a solid one, as Congress would be willing to appropriate a reasonable amount of money.

Dr. Antisell, of D. C., was sorry that the discussion had assumed a political character.

Dr. Janney, of New York, said that it was the duty of this body to ask the Board of Health if the country needs any new organization, and leave it to the Legislature as to how it should be formed.

Dr. Hunt, of New Jersey, thought that there should be frequent consultations with the State Boards and the National Board. He thought we had better wait before asking for a change.

Dr. A. N. Bell, of New York, was glad to see that one important fact had been recognized in the proposed act, viz., the emphatic recognition of the National Board of Health. He deprecated the idea of allowing the regulation of health matters to pass into the hands of politicians.

Dr. Clendennin said that the fact must not be forgotten that the National Board of Health had asked for additional powers, which Congress had refused to give; and, also, that bills presented by the Board had subsequently been withdrawn.

Dr. Billings wished to correct a wrong impression, viz., that bills had been withdrawn by the Board from Congress. Three bills had been introduced: the first, relating to sanitary matters,

had passed; the second, introduced by Mr. Acklen, of Louisiana, and not approved by the Board, had been shelved; and a third one, relating to infected districts, had also been shelved.

Dr. EDWARDS's resolutions were then passed.

Dr. KEDZIE's paper on *The Temperature of Living Rooms*, was then read by the Secretary.

Dr. ANTISELL, of Washington, D. C., said that Dr. Kedzie should have drawn some deductions from his paper, and made some general remarks in reference to the temperature of the air.

The paper was, on motion, accepted, and referred to the Association, with a request that it be published.

Dr. A. L. CARROLL, of New York, then read a paper on *The Personal Factor in the Etiology of Preventable Diseases.*

On motion, the paper was accepted, and referred to the Association, with a request that it be published.

An abstract of a paper on *Microscopical Sections from Cases of Diseases of the Brain and Spinal Cord* was read by Drs. C. K. MILLS and CARL SEILER, of Pennsylvania. Microscopic specimens were shown, to illustrate the subject.

On motion, the paper was accepted, and referred to the Association, with a request that it be published.

On motion, the Section adjourned at 4.55 P. M.

THURSDAY, June 3, 1880.

The Section was called to order by the Chairman at 2.15 P.M.

Dr. BILLINGS moved that Dr. WINES be permitted to explain the census blanks. Carried.

Dr. WINES, of the Census Office, then proceeded to such explanation, after which Dr. BILLINGS offered the following resolution, which was, on motion, accepted.

Resolved, That this Association approves the plans proposed by the Superintendent of the Tenth Census for the collection of data with regard to the insane and idiots of the United States, and that it urges upon all physicians that they should aid, in every suitable way, the efforts of the Census Bureau to perfect its statistics in regard to idiots and the insane.

Dr. CHAS. W. PAGE, of Connecticut, then read a paper entitled *Moral Treatment of the Insane.*

On motion, the paper was accepted and referred to the Association, with a request that it be published.

Dr. A. N. BELL, of New York, read for Dr. R. J. O'SULLIVAN,

of New York, the report of the Committee on the *Intervention of the Physician in Education.*

On motion, the report was adopted, and it was referred to the Association with a request that it be published.

The report of the *Committee on Sanitaria* was read by Dr. A. N. BELL in the absence of the Chairman of the Committee, Dr. BOWDITCH, of Massachusetts.

On motion, the report was adopted and referred to the Association, with a request that it be published.

The Chairman's Address, which was read before the Association and referred to the Section, was referred back to that body, with a request that it be published.

Dr. A. N. BELL, of New York, offered the following resolution, which was adopted.

Resolved, That a general sanitary organization is a necessity of every enlightened commercial nation, and that the service of the National Board of Health of the United States since its organization has been such as to impress us that both in its personnel and organization it is entitled to the confidence of the people, and we join the American Public Health Association and the National Academy of Sciences in earnestly recommending to Congress that the suggestions and estimates of the Board receive their legal sanction, believing that the money asked for is necessary to the work of the Board, and will be a most judicious expenditure of public money.

The following resolution, offered by Dr. M. K. CARROL, of New Jersey, was adopted:—

Whereas, The value of vital statistics depends upon their scientific accuracy as regards the etiology as well as the diagnosis of disease, this Section would urge upon this Association the importance of recommending that every medical school within its jurisdiction establish a chair of Public or State Medicine as an essential part of its curriculum.

Dr. J. V. QUIMBY, of New Jersey, then read a paper on *The Criminal Use of Chloroform.*

On motion, the paper was accepted and referred to the Association, with a request that it be published.

Dr. W. H. LATHROP, of Massachusetts, then read a paper on *Thoughts regarding Almshouses.*

On motion, the paper was accepted and referred to the Association, with a request that it be published.

Dr. ANTISELL then read a paper on *Suspicions of Poisoning.*

On motion, the paper was accepted and referred to the Association, with a request that it be published.

Dr. W. F. THOMS, of New York, read a paper on *Humane Societies.*

On motion, the paper was accepted and referred to the Association, with a request that it be published.

The following resolution was offered by Dr. A. N. BELL, and carried:—

Section IV. recommends that it be hereafter designated simply STATE MEDICINE; it being understood that the various subjects heretofore named in the title, and all other subjects for the execution of which State authority is necessary, under the said Section (IV.) are included.

Dr. BELL moved that the Chairman appoint a committee of three to be a Committee of Selection in accordance with the vote of the Association. Carried.

On motion, the Section at 4.35 P. M. adjourned *sine die.*

JAMES F. HIBBERD, M.D., Ind., Chairman.
THOS. F. WOOD, M.D., N. C., Secretary.

ADDRESS IN MEDICAL JURISPRUDENCE, PSYCHOLOGY, CHEMISTRY, STATE MEDICINE, AND PUBLIC HYGIENE.

By JAS. F. HIBBERD, M.D.,

RICHMOND, IND.

At no period of the world, it is supposed, has there been so much careful thought and intelligent activity directed to the affairs embraced by the Section over which I have the honor to preside, in an equal time, as during the year since the last convocation of this Association. My Section includes medical jurisprudence, psychology, chemistry, State medicine, and public hygiene, a quintuple monstrosity, at least in name, and it is not a trivial undertaking I am commanded to perform by our by-laws, *i.e.*, to sum up the results of this careful thought and intelligent activity, and present it at this time and in this way to this Association.

As illustrating the literary activity in the premises, I find by examining the *Index Medicus* that during the year ending with April last, there were published on medical jurisprudence 15 books and reports, and 223 articles in periodicals, making a total of 238 in this department of my Section.

On psychology, 81 books and pamphlets, and 367 articles in journals, making a total of 448; and these are on insanity alone, do not include writings on psychology in general, nor the numerous articles in books on the subject, which constitute only a part of such publication.

On State medicine, 114 books and reports, and 380 articles in journals; total, 494.

On public hygiene, 220 books and reports, and 811 articles in journals; total, 1031; and making a grand total of 2211, without taking into account the publications on chemistry which are so commingled with physics as to be inseparable in the published record.

To have mastered the contents of these publications and extracted their substance for your edification at this time, would have required me to peruse a little over one book and about five essays each day of the year, Sundays included. I did not read them all.

Up to last year, Dr. Billings reports[1] that publications concerning public hygiene and related subjects numbered, of books, 147; articles in journals and transactions, 205; and journals and periodicals, 107; making a total of 459 publications for all previous time, against 1525 in the same departments during last year alone.

Do not these facts afford me substantial grounds for my opening declaration that the year has been exceedingly prolific in thought and activity relating to the matters embraced in my Section?

MEDICAL JURISPRUDENCE.

Not much of the literature of medical jurisprudence of the year has been in the English language, and no important book. But an event has occurred that may lead to a wholesome review, and a speedy reform, in some affairs existing among us as relics of a barbarous age. Humanitarians have long lamented the horrors of hanging as a means of inflicting capital punishment obedient to judicial judgment. Last winter a man was hung in Washington City, and when the trap fell the shock severed the culprit's head from his body, to the horrification of the spectators, and to the disgrace of the science and the civilization of the age. A newspaper report says: This attracted the attention of the national law-makers; and Congress, by resolution, has asked the National Academy of Sciences whether they know a better way of killing, than hanging, those who have forfeited their lives to the public by heinous crimes.

If such question has been asked, we can safely assume that the National Academy of Sciences will speedily advise the Congress and the world of more than one way in which this unhappy necessity can be accomplished quietly, promptly, and unfailingly, without a tithe of the publicity, the offensiveness, or the demoralization to the living, that is inseparable from the current method of hanging.

[1] Index Medicus, vol. i. Nos. 3, 5, 7, 8, and 9.

It seems unaccountable that a refined and æsthetic people could have so long stood by and witnessed the horrors of hanging without uttering a word of effective remonstrance. Not long since, a fugitive criminal was arrested in New Orleans, and taking a little vial of prussic accid from his vest pocket, swallowed its contents and was dead in a few minutes without a struggle; and yet a Christian people have made no movement to insist on this method supplanting the hanging, notwithstanding that a broken rope and a second suspension is no unusual occurrence. Within the year an experimental scientist accidentally discharged the electricity of his battery into his own person, and instantly his life was extinct without consciousness or the quiver of a muscle; and yet a humane and enlightened nation have not stirred to substitute this for judicial hanging, notwithstanding the victim of the hangman's noose is often a writhing spectacle in mid-air for twenty minutes, so horrifying that no unofficial person of ordinary humane feelings will witness it except for scientific purposes; and yet so attractive to the depraved, that they will fight for an opportunity to have full view of the scene which only serves to deepen their depravity, and never, we may advance as a psychological fact, serves for the betterment of any class of people who have knowledge of its incidents.

Let us hope that, by virtue of means to be formulated by the advanced science of the day, we are near the termination of such scenes of useless violation of the better instincts of our nature, and the higher sentiments of our refined culture.

In this connection may be noticed another step of progress manifested quite recently. It became the official duty of Judge Heller, of Indianapolis, to pass sentence on three murderers who had been condemned to be hung by a jury in his court. He fixed Wednesday, the 29th of January, 1879, for the execution, thus breaking the almost universal custom of courts, in requiring capital punishment to be inflicted on a Friday, and by this means aiding in the maintenance of a superstition that ramifies through no inconsiderable portion of the industrial portion of all civilized countries.

This act of Judge Heller's is a sample of jurisprudence, but its psychological bearings brings it within the pale of medical jurisprudence.

PSYCHOLOGY.

Since the demonstration that certain mental functions are the product of the activity of certain more or less definite parts of the brain, psychology has risen to an interest among medical men, far in advance of its former position. Two classes, at least, of psychologists must be recognized; for distinction, we may characterize one class as theological psychologists, and the other as scientific. The former are active, earnest, and positive, but perhaps not more so now than for a long time; the latter, to which physicians generally belong, have within a few years become most thoroughly aroused to the interest of the investigation, to determine whether certain parts of the brain give rise to certain attributes of mind, or the brain, as a whole, is the organ of the mind as a whole.

These classes are not separated by a fixed, broad line of demarcation; in fact, there is an ever-present tendency for the theologist to wander forward into the domain of the scientist, and an equal proclivity in the scientist to rescan the fields of theology, nevertheless, the essential characteristics of the classes are distinct; the theologist regards the human soul as a distinct psychical entity, manifesting itself in mind, which is the product of the soul's action on the brain, admitting that if the brain be disordered, the mind will be imperfect; but this in nowise affects the real condition of the soul. On the other hand, the scientist gives his attention exclusively to the brain, seeking to know the laws by which it manifests mind, and not troubling himself about anything back of this, other than the tangible incentive to the brain's action.

There is no necessary conflict between these classes of psychologists, and they may work together in entire harmony, so far as the investigation of the brain and its normal and abnormal action are concerned.

For a long time, the scientist has regarded the brain as the seat of the mind, and all his psychological theories have rested on this proposition, with an occasional recognition of the possibility that other parts of the nervous system might have an agency in the production of phenomena sometimes accounted mind.

About a century ago, Gall and his coadjutors taught the doctrine of special localities in the brain for the production of

limited psychical functions; but the phrenological hypothesis never reached acceptation with the scientific world, and had already fallen into desuetude, when, about ten years ago, Hitzig and Fritsch promulgated the results of their researches into the functions of the convolved regions of the cerebrum. This announcement constituted an epoch in psychology, notwithstanding that neurotic scientific advance, both theoretical and experimental, has long been steadily leading toward this, an unrecognized, goal. Since that event, a number of persons, in all the cultured nations, have been making known the fruits of their investigations, which are illuminating this department of knowledge with a brilliant light, full of promise, not only in psychology, but in all the varied and intricate ramifications of the whole range of neurology. This activity has continued through the year, under notice, and we may expect in the end great advances toward certainty in psychology, through a fuller knowledge of the histology, the physiology, and the pathology of the brain.

We have already seen that the year has produced 81 books and pamphlets and 367 journal articles on insanity alone, and there is just ground for this activity. Either the insane are increasing out of proportion to the general population, or we are more carefully seeking out the insane, or, possibly, we are becoming more acute in our diagnosis of disordered intellect, and are enlarging the borders within which we claim mental operations to be pathologically aberrant. However this may be, it is patent that the great army of lunatics is recruiting faster than death and recovery thin out the ranks, and the result is accumulation of numbers, and this involves enlarged accommodations and increased expenditure for maintenance so far as the victims of this disorder are cared for at the public expense.

This leads, of propriety, to the inquiry, how far the State ought to go in the guardianship and maintenance of the insane, and so far as she ought to go what is the best method of proceeding? As regards the latter query, can it be successfully maintained in the light of advanced knowledge of the pathology and therapeutics of the insane that the great overgrown palatial structures, known as insane hospitals or asylums, afford the speediest, the most economical, in a word, the best way of caring for the insane? And in connection with this we must study the other query, how far must the State go in providing hospitals

for the insane? As an abstract proposition no one will hold that the State should provide treatment and care of the ill who are able to provide for themselves. If a man be ill of consumption the State is not expected to furnish him either a house, a doctor, or a nurse, if he be able to furnish them himself. Consumption is a disease of the lungs, insanity is a disease of the brain; why should the State have more regard for the brain than the lungs? The answer is twofold: In the first place, a man with a brain disorder that constitutes him a lunatic is supposed to be incompetent to take care of himself or his business; and next, it was formerly the general sentiment that to treat mental disease required a doctor with special training. The latter view is probably not now held by any considerable number of thoroughly educated physicians, there being in fact no more difficulty in the therapeutics of brain disease that in the treatment of morbid conditions of the system at large, and but little more strategy required to conceal the want of knowledge in that behalf.

Touching the other branch of the answer, it may be remarked that its full consideration would lead us a long way, demanding whether the State should assume the guardianship of the affairs of all persons who cannot manage them properly themselves, and if the State should, to what extent? Should she examine the person and, according to his condition, determine whether to take charge of his affairs or not? Or examine his affairs, and from their condition determine whether or not to take charge of him? Of course, where a lunatic is such that he endangers the person or property of his fellow he must be taken in charge by the State, possibly for his own sake, most surely for the sake of his fellows. But the lunatic who is in nowise a menace to the person or property of his neighbor stands on ground widely different, and we are on the threshold of the time when both physicians and statesmen must seriously inquire whether the State should take cognizance of his situation.

The tendencies of our social life must be considered by the psychologist, and there are questions of most serious import. If it be true that acquired conditions are transmissible from parent to child, the necessity of looking after the training of the youth is vastly more pressing now than when it was esteemed that evil habits, acquired in a wrong education of the young, ended with the life of him who acquired the evil habit.

A recent writer[1] has said: "Intemperance is well known to be transmissible, and those who become victims of this disease through hereditary tendencies are seldom if ever cured, and they transmit to their children not only a tendency to drink but to crime and insanity also." This is not thoughtless verbiage, but the true status of the problem at the point that the investigation has now reached. And as it has been demonstrated that certain crimes are irresistibly committed under pathological psychical conditions, as, for example, kleptomania and homicidal mania, will we not presently discover that all wrongs against our fellows and against society are the result of aberrant reason, due to an imperfect brain and nervous system? And if these imperfect brains, in some instances, come by inheritance and may always be transmitted, and if a thieving son may be such because he had a drunken father, and if an insane parent may have children, some of whom may have general mania, some dipsomania, some klopemania, and the like, all due to an imperfect or disordered brain and nervous system, may not this disordered nervous system be the generator of disease in other organs and tissues than nervous organs and tissues? In truth, have not many competent physicians already observed and recorded instances where the children of insane parents have not only been insane, but some have been the victims of meningitis, others of tuberculosis, others again of crooked spines and crippled limbs, and still others of a low and imperfect general vitality? If all these things presently prove true, may we not expect to meet with a new theory, that shall assert that certain phases of disease, mental and physical, are but the correlative modes of one great principle of defective human organization, even as we now see that electricity, chemical action, heat, and gravity are but different modes of motion?

These may be real truths seen darkly in the dim twilight of the coming day of fuller biological knowledge; they may be phantoms of the mists of that dim twilight which the risen sun of biological science will speedily dissolve out of our thoughts; but in either, or any, event we know enough now to realize that there is an urgent demand for fresher thoughts and broader views in regard to the exercise of some of the highest attributes of a civilized and Christian people, involving a review, and a possible reconstruction, of our aims, and a consequent reorgani-

[1] J. R. Weist, A.M., M.D., in a Presidential Address to the Indiana State Medical Society, 1880.

zation of our labors in a field of Christian activity so sacred that it has been held almost a sacrilege to question or to doubt, that it was the immaculate inspiration of the noblest of human endowments, and the most acceptable service a Christian could offer in behalf of his fellow man, *i. e.* the protection, care, and preservation of those who are imperfect in body or mind. But we have arrived at a development of wisdom and courage wherein we acknowledge nothing above our privilege of inquiry, nor nothing below our obligation of duty to examine, and these exercises carry with them the corollary of a covenant to correct whatever our enlightened judgment may discover to need amendment. We must now, or soon, recognize the truth of the following statement by the author just quoted (Weist), who, in speaking of some of the evils of our social life, remarks: "Our philanthropy even contributes largely to extend the evil of physical degeneration. 'In primitive phases of civilization those of weak and defective blood were more liable to be swept into an early grave than to-day; now all such are skilfully nursed up to the fertile period, to the multiplication and perpetuation of their kind. The profound study, the active sympathy and systematic charity bestowed upon the wrecks of our race for their cure and preservation, when compared with the prevailing indifference as to the means of preventing the steady increase of such unfortunates, is far from flattering to our foresight in economy and beneficent work.' Vast infirmaries, hospitals, and asylums are built and sustained at enormous expense to shelter and keep alive the constantly increasing number of those hopelessly bankrupt in vital condition, and thus aiding in their increase and perpetuation. The problem of how to exercise our benevolent instincts without helping to bring about so deplorable a result is an important one." But the psychologist, the sanitarian, the statesman—in short the philanthropic humanitarian with competent knowledge, must ponder this problem, and solve it for practical purposes as he solves other problems of its kind, with sweetest charity in his heart, with noblest generosity in his acts, and yet under the full recognition that it is his paramount duty to the future to produce *mens sana in corpore sano.*

STATE MEDICINE.

Last year in Atlanta Dr. S. E. Chaillé read an excellent essay in which he defined State medicine to be "The application by

the State of medical knowledge to the common weal; and embraces every subject for the comprehension of which medical knowledge, and for the execution of which State authority, are indispensable." This is a neat and exact definition of State medicine, and it covers a field in which activity and progress have been conspicuous for several years, and for the last year most markedly so, as already shown in the number of publications mentioned in the opening of this paper.

Municipal boards of health exist in most of the cities and large towns of the Union, and State boards of health have been organized in more than half the States themselves. These have a wide range of usefulness, but lack a common bond of unity in work, and a common method of notation by means of which the results of their labors may be compared and classified so as to give the highest degree of knowledge and yield the greatest measure of value. The standing committee on sanitary legislation of the National Board of Health "employed competent legal authority . . to collect and collate the sanitary laws of the United States and of the several States, including not only the statutes, but the decisions of the several courts, on all questions involving the public health." This committee reported the result of their investigations, and it "needs but a brief examination to show that the sanitary legislation of the great majority of the States is in a very unsatisfactory condition. Even those which have provided State boards of health, have not done so on any uniform, or well-considered plan; and very few of such State boards are so organized as to be able to meet the emergencies of an epidemic."

The National Board of Health made an attempt to classify and tabulate the large amount of material contained in the returns of the State and local boards of health, but these returns have been made on plans so dissimilar, and their statements are so incongruous, as to render them utterly useless for general statistical purposes. We must look to the National Board of Health for a plan to correct these discrepancies, and we must support that Board in an effort to secure a uniform method of recording and returning vital statistics that shall apply to the whole country, and by which the lessons of such statistics may be speedily arranged and made as satisfactory as their nature admits. This can be done without infringing, in the least, the independence of the State and local boards. The National Board

will have the means to devise the very best methods of conducting sanitary operations in all parts of the country, and the State and local boards, composed of men anxious to make their respective administrations of the utmost service to the public, will quickly seize and heartily respond to any suggestions of the National Board that will bring them into harmony with other organizations of the kind, and at the same time enable them to do the greatest good tc the greatest number with the greatest ease and certainty.

This seems an appropriate time and place to speak further of the National Board of Health, and for reasons to be mentioned presently I deem it a duty to call attention pointedly to the statement I have to make concerning it.

On the 3d of March, 1879, Congress passed an act authorizing a National Board of Health, to consist of one member from the U. S. Marine Hospital service, one from the Medical Department of the Army, one from the Medical Department of the Navy, one from the Department of Justice as legal adviser, and seven gentlemen from the country at large, to be selected by the President of the United States. The following gentlemen were selected accordingly: Preston H. Bailhache, M.D., U. S. M. H. service; John S. Billings, M.D., U. S. Army; Thomas J. Turner, M.D., U. S. Navy; Samuel F. Phillips, Esq., U. S. Department of Justice; Samuel M. Bemiss, M.D., La.; Henry I. Bowditch, M.D., Mass.; James L. Cabell, M.D., Va.; Hosmer A. Johnson, M.D., Ill.; Robert W. Mitchell, M.D., Tenn.; Stephen Smith, M.D., N. Y.; and Tullio S. Verdi, M.D., D. C. The selection of these sanitarians to constitute the National Board of Health in the beginning was an earnest of its future usefulness. The Board organized April 2d, 1879, by selecting Dr. Cabell President, and Dr. Turner Secretary, and called a meeting at Atlanta, Ga., for May 5th, in connection with the annual session of this Association, to which the Board had invited, and where it met and consulted with, the leading sanitarians, and State and municipal health officers of the Union. A foundation for the summer's work was laid at this meeting, and the appropriation of $500,000 by Congress on June 2d enabled the Board to pursue many lines of investigation with profitable results; results which were commended by the American Public Health Association at its meeting in Nashville in November, and were approved by the National Academy of Sciences in the last of December, at which time

the Academy recommended to Congress to continue the Board under its then organization, enlarge its powers and endow it with funds to complete and publish the investigations it then had under weigh, and to institute and conclude others that the public weal demanded.

Some of the operations of the Board during the year have been—

To collect information concerning the sanitary condition of the principal cities and towns of the United States.

The appointment of a commission to investigate the yellow fever in the Island of Cuba. This commission consisted of Dr. Chaillé and Col. Hardee, of New Orleans, Dr. Guitéras, of Philadelphia, and Surgeon Sternberg, U. S. Army. These gentlemen spent July, August, and September in Cuba, and made a preliminary report on their return, which has been published, and presents multiple facts of prime value in the study of yellow fever and its management.

Engaging Professor Remsen, of Johns Hopkins University, to investigate the best method of determining the amount of organic matter in the air.

Directing an investigation as to the effects of disinfectants, especially when used for disinfecting inclosed spaces, under the direction of Dr. Folsom, of the Massachusetts State Board of Health.

Securing an investigation of the composition and merits of various patent disinfectants, by Prof. Chandler, President of the New York City Board of Health.

An investigation of the adulteration of food, by Dr. Kedzie, of the Michigan Board of Health; and of the imperfection of drugs, by Prof. Diehl, of Louisville, Ky.

An inquiry into the diseases of food-producing animals, yielding special reports by Prof. Law, of Cornell University, Dr. Laintard, Veterinary Surgeon, New York, and Dr. Verdi, of Washington.

An investigation of the flow of sewers in relation to their sizes and gradients, by Col. Waring, of Newport, R. I. A preliminary report in this behalf induced the adoption of the recommendations of Col. Waring in constructing a system of sewerage for Memphis which cost $225,000, that would have cost $500,000 if constructed in the ordinary manner.

Instituting a sanitary survey of the eastern coast of New

Jersey bordering on New York, under the direction of the New Jersey Board of Health.

A sanitary survey of the city of Memphis, begun at the close of the yellow fever epidemic last autumn under the direction of Dr. Billings, U. S. Army.

Investigating the hygiene of the mercantile marine as to what legislation is expedient to improve its sanitary condition, by Dr. Bailhache, of the U. S. Marine Hospital service.

An investigation of diphtheria, as it occcurred in northern Vermont, by Dr. Elisha Harris, New York.

An investigation of the influence of soils upon sanitation, especially with regard to drainage and methods of disposal of excreta, by Prof. Pumpelly, of the United States Geological Survey.

This rehearsal of the work of the National Board of Health during the year, and the naming of the men selected by the Board for special services, is made, not only as an index to the sanitary activity at this time, but particularly to call the attention of this assembly to the scope and tenor of the service to which the Board has been appointed according to its own interpretation, and to the quality of men it has selected to aid it in scientific investigations.

It is my conviction that the mission of the Board has been largely misunderstood by laymen, and by no inconsiderable number of the medical profession as well. Influential newspapers last summer sneered at the Board, insinuating that its situation was a kind of politico-professional paradise, within whose realms were luxurious ease and fat salaries, with authority to the inmates to name friends to pleasant journeys by sea and by land, with ten dollars per diem salary, and all expenses paid. It was intimated that half a million dollars had been given it to prevent an outbreak of yellow fever, and yet it allowed that destroyer to gradually develop in Memphis from late winter until early summer, when it bloomed into a full-grown epidemic without let or hindrance. The premises of this statement were wrong, the argument illogical, and the conclusion most unjust to a body that was diligent and untiring in its labor to control yellow fever, and but for whose active exertions and intelligent plans the yellow fever would, in all probability, have devastated many cities of the lower Mississippi valley as

it did Memphis, and possibly, also, not have been confined to that region.

A leading error, apparently, of those who reflect unjustly on the National Board of Health, is the idea that it was created to suppress yellow fever alone, while, as you are well aware, it was ordained to promote, increase, and administer sanitary science generally; and the act of Congress of June 2, 1879, which enlarged its powers and endowed it with means, was entitled "An act to prevent the introduction of contagious or infectious diseases into the United States," making no special mention of yellow fever. True, yellow fever was at the moment the most prominent and threatening disease to look after, and the Board gave it prompt and efficient attention. Chiefly to secure indications to manage it, eight inspectors of quarantine were appointed to the Atlantic and Gulf coast, from Portland, Me., to the mouth of the Rio Grande on the frontier of Mexico. Drs. E. Harris, E. M. Wright, A. N. Bell, W. H. Elliott, Jerome Cochran, J. D. Palmer, Wirt Johnson, and J. H. Pope were selected as these inspectors. And here again, the character of the gentlemen appointed testifies to the discretion of the Board. Beside these, as soon as the existence of yellow fever at New Orleans and Memphis was announced, additional inspectors were appointed at, or in the immediate vicinity of the infected spots, seventeen in number, though not all on duty at one time, who were made the confidential agents of the Board, and its representatives to the State and local boards in the infected and threatened districts. It was to this timely and prudent movement of the National Board that some degree of harmony of action was established among the various State and local boards that were charged with the immediate execution of sanitary regulations. And it should be clearly recognized that the National Board does not supersede local sanitary organizations, nor perform their work. The immediate supervision of the sanitation of cities and towns is under parties or organizations created by State autonomy; and, under our form of government, these are not amenable to the general government or its agents, except in so far as their executed, or omitted, acts influence the public welfare outside their State jurisdiction. But the National Board has a wider range of observation, and more abundant means of investigation, and can, therefore, obtain broader views of the necessities of the present and the future at any

moment, and can better combine the interests of the whole people in formulating regulations for any given point. In short, from observation coextensive with the country, the National Board can map out a course of action for each part which shall be a fraction of a harmonious whole, and, therefore, the most efficient and valuable possible. And there is but little doubt that regulations thus framed would be put into execution by the proper authority everywhere, and we should be no longer subject to the personal annoyance and business interruption of shot-gun quarantines and local embargoes on commerce.

Much of the unfriendly criticism of the National Board of Health has had its genesis in the idea that prophylaxis was an exact science, and that perfect disinfection was at all times within the reach of the diligent and well informed. Of course a superstructure erected on this feeble foundation soon falls a wreck about its occupants. Sanitary science may be regarded as in its infancy. While the disciples of medicine for centuries have offered the sacrificial cock on the altar of Esculapius, it is only a few decades since it was esteemed an obligation to publicly present offerings at the shrine of his fair daughter Hygeia. The National Board of Health will fulfil no higher mission by insisting on the execution of known sanitary laws than in the additions it will make to their thoroughness and practicability.

And it is not only the advances in sanitary science that may be made in the United States that the National Board will aid in, and avail itself of, but it has been the means of Congress authorizing the President to invite the co-operation of all other civilized nations in an International conference of sanitarians to assemble in Washington, and the Board will be a party to the mutual enlightenment that will come of personal intercourse and exchange of sentiments with the chief sanitarians of the cultured nations of the world.

It is of prime importance that physicians should have a clear conception of the mission, the character, and the plan of operations of the National Board of Health, for without the sustaining influence of the profession as a whole, the Board may have to succumb to the inane assaults of those who rail at every earnest movement they have not the capacity, or will not exercise the industry, to understand. But with the constant and cordial support of the medical profession, the National Board of Health can surmount all obstacles, growing in knowledge and useful-

ness until it shall be an indispensable factor in the maintenance of the prosperity, and the progress in happiness, of the American people; and as the only representative body of the whole profession in the United States, the American Medical Association should take a leading part in encouraging the National Board of Health, and supporting and assisting it in every right and laudable movement.

If the periodical visitation of Asiatic cholera over the world should continue in cycles of seventeen years, it would reach this country again in 1883; and if New York has not abandoned the proposition to hold a world's exhibition during that year, this perambulating plague would meet with more than its usual facility of transportation, in the flux of people and things that would concentrate from the ends of the earth to constitute the grandeur and success of that Universal Fair. Possibly the International sanitary conference may be able to devise measures, to be enforced by all the countries represented, that will arrest the progress of the devastating epidemic and confine it to its native heath in India, or at least forbid it to wander beyond its quadrennial, septennial, and duodecennial excursions, whether these be generated by the spots on the sun, or spring out of mundane conditions not less occult.

To accomplish this would be an achievement worthy of the science and the energy of the age, and in a utilitarian sense would return a millionfold both the expense and the labor of the agencies employed, not to mention the human anguish it would prevent, all of which is a possible consummation of the intelligent, concerted, and simultaneous application of known sanitary science to the territory of the commercial world.

THE NATIONAL BOARD OF HEALTH, AND NATIONAL QUARANTINE.

By JOHN S. BILLINGS, M.D.,

SURGEON U. S. ARMY.

It has seemed good to the chairman of this Section that there should be presented to it, at this meeting, an account of the origin and organization of the National Board of Health, in order that some account of this new medical departure shall form a part of the records of this body, so that Macaulay's New Zealander will be able to prepare a full report on the subject, if he can only obtain a complete set of the "Transactions of the American Medical Association."

I have acceded to the request that I should prepare this paper, with some misgivings; but attempts to excuse myself have proved fruitless, and I can only say that I have done the best I could, with the very limited time at my disposal.

That some form of a central sanitary organization must sooner or later be created by the United States, has long been foreseen by those who have given attention to such matters; but it is only within the last ten years that the discussions on this subject have taken any definite form. In saying this, it is not meant to assert that definite proposals for a national quarantine system have not been of a much older date. But a national quarantine system is by no means the equivalent of a national health organization, and the two will be considered as quite distinct in this paper. Each has had its partisans and opponents—the one being in some cases arrayed against the other; and, in order to understand some of the controversies which have arisen with regard to the National Board of Health, it is essential to know that those in favor of such a board, may or may not favor a national quarantine; while some of those most prominent in urging the creation of a national quarantine, have not only not

desired the organization of a National Board of Health, but have most strenuously opposed it. For more than eighty years, and in spite of repeated failures, attempts have from time to time been made to induce Congress to place under some department of the government the control or supervision of the quarantine systems of the several ports of the United States. The immediate cause of these attempts has usually been the occurrence—in some part of the country—of an epidemic of cholera or yellow fever, believed to be due to importation from abroad.

The arguments in favor of a national quarantine system are well known. The various local systems of our several national maritime ports are not uniform as to time, carefulness of inspection, or methods of treating infected ships; nor are the great majority of such ports either willing or able to meet the heavy expense of a really efficient quarantine system, which shall permit vessels to return to commerce with no more delay than is necessary to secure their proper inspection and thorough cleansing. If any port fails to keep up such a system, it to a great extent destroys the value of the quarantines of other ports, and of other places. Hence, the interior of Alabama has been infected through Florida ports; and Arkansas, Mississippi, and Tennessee are to a great extent dependent for safety upon what New Orleans may choose to do, and have suffered severely in consequence. The prevailing ideas, with regard to the powers of the general government, in this respect, may be briefly stated as follows:—

The United States, by virtue of the control which the constitution gives it over commerce with foreign nations, and between States, has the right to prevent ships coming from a foreign country or from another State, from entering any port, unless they have complied with such regulations as it may prescribe. In like manner, it has the right to prevent any conveyance, person, or thing from passing from one State into another, unless such passage be made in accordance with the rules which it may establish. It cannot, however, undertake to interfere with conveyances or persons going from one part of a State to another place in the same State. Whether it has a right to compel a State or city to admit a conveyance or person coming from foreign countries or other States, is a question upon which there is more difference of opinion among jurists; but at present the decided majority are of the opinion that it has no such right, and nearly

all those who think that it does possess such power are of opinion that it would be inexpedient to exercise it.

As it is not proposed in this paper to give any account of the various efforts to secure a national quarantine system, except in so far as these have immediate relation to the origin of the present National Board of Health, it is sufficient to merely allude to the proceedings of the quarantine conventions held in 1859–1860, as containing some interesting and valuable discussions on this subject.

Let us now turn to the subject of a national health organization properly so called.

In 1869 the fact that such a department of the Government would soon become necessary, together with its probable needs, were used as arguments before Congressional committees in favor of the formation of a large medical library in Washington, and the commencement of a complete collection of sanitary reports and statistics; and in the spring of 1870, in connection with reports to the Secretary of the Treasury upon the reorganization of the Marine Hospital service, the relations of a department of public health to the several medical departments of the Government were briefly discussed.

The first published scheme for such a department was the bill prepared by Dr. C. C. Cox in 1871. This bill as introduced into the Senate, in December, 1872, together with the report of Dr. Cox upon the necessity for a national sanitary bureau, will be found in the first volume of the reports of the American Public Health Association.

This bill provided for the establishment, under the direction of the Department of the Interior, of a national sanitary bureau with a chief executive officer to be known as the commissioner of such bureau. His duties, which are specified at great length in the bill, may be summed up as being to collect information on all matters connected with sanitary science, and to report on the same from time to time. He was to appoint whatever additional officers might be required, including chief clerk, chemists, experts, etc. etc.

There was a general feeling among sanitarians that this bill was not opportune, that the circumstances were such that it would lead to purely political appointments, and that the result would be upon the whole prejudicial to the cause of public hygiene. It, therefore, received little or no cordial support.

The American Public Health Association did not recommend its passage, and it was practically pigeon-holed in the Congressional committee to which it was referred.

The yellow fever epidemic in 1873 resulted in the introduction, by Hon. Mr. Bromberg, M. C. of Alabama, of a bill for a national quarantine, which bill was based mainly on the recommendations of Dr. Harvey Brown, U. S. A., who had in 1872 made a report on quarantine on the Southern and Gulf coasts, in which he strongly urged the importance of a national system.

During the winter of 1873–74 several conferences were held at Washington on the subject of a national health bureau and a national quarantine system.

The discussions at these conferences made it clear that there were two distinct parties; the first represented by Mr. Bromberg's bill, which was to prevent the importation of contagious and infectious diseases into the United States—in other words, to secure quarantine alone. For this purpose the surgeon-general of the army, the surgeon-general of the navy, and the supervising surgeon-general of marine hospitals were to constitute a board, whose duty it should be to prepare quarantine regulations which were to be enforced by an officer from one of these services to be detailed for that purpose.

The other party urged that the utility of such a board would be comparatively small, and its existence probably brief. They desired that its scope should be made much wider, somewhat like that of the national sanitary bureau proposed by Dr. Cox, although they did not approve the placing such a bureau at that time under the control of any one man—in other words, preferred a board to a commissioner.

The size of this board, the manner of selecting its members, its precise duties, and the amount which should be allowed for its support, were all subjects upon which it was found hard to reconcile the opposing views.

Mr. Bromberg's bill passed the House and failed in the Senate, not so much because of any active opposition as because of a request made by Mr. Thurman, that it should be passed over to give time for reflection, and his statement of the difficulties of the question is worth quoting. He said: "Every seaboard State, and I believe every State bordering on either of the great lakes, has its police and quarantine regulations for the preservation of its people against any danger of vessels coming into port

with persons having infectious diseases; and those health regulations have been decided by the Supreme Court to be within lawful competency of the States to enact. If that is the case, there is a little trouble in knowing how the United States is to interfere. If the States have authority to make these regulations, and the United States has like authority, it is very easy to see what a conflict of jurisdiction might arise between the officers of the one and the officers of the other. If, on the other hand, the whole matter belongs to the States, then it ought to be left to them; but if it is one of those cases of concurrent jurisdiction until Congress shall act, then the effect of the action of Congress would be to oust the State jurisdiction. It is a question of very great consequence, and I see that the committee in reporting the bill had felt that, and therefore provided that the regulations to be made under this act shall not interfere with the regulations of the several States. But it seems to me that there is very great difficulty in that, for the health regulations of the States are different one from the other. The health regulations of Massachusetts are, perhaps, different from those of New York, and both of them different from those of South Carolina, or of Georgia, or of Louisiana. How this board is to make any general regulations that will be effective, and not interfere with the State regulations, I do not clearly perceive."

For a time this was the end of proposals for national quarantine legislation.

Meanwhile, both in this Association and in the American Public Health Association, the subject of a National Board of Health, properly so-called, continued to be discussed, and in 1875, Dr. H. I. Bowditch, of Boston, acting as chairman of the section of State Medicine and Public Hygiene, delivered an address before the Association, upon a future health council of the Nation, in which he began by the very emphatic declaration that, in his opinion, any attempt to establish a national council until there were State boards of health in every State, would not only be premature, but positively prejudicial to the very object which we all wish to gain.

In this address, which will be found in Vol. 26 of our Transactions, after alluding to the preceding action of the Society on this subject, commencing in 1871, by the resolutions of Dr. Logan, he gave a summary of the prevailing opinions among

his correspondents in the various States and Territories. Of seventeen of these, only two advised immediate action looking to the establishment of such a department.

He then proposed a plan for a national health organization derived mainly from that sketched many years ago by Jeremy Bentham. The essential features of this plan were, first, a Secretary of Health, who should be a member of the Cabinet, and have control of all health matters in the nation, including the medical departments of the Army, Navy, and medical libraries and museums belonging to the country, etc.; second, a health council, composed of one representative from each State, and four representatives at large, to be selected by this Association.

This council was to have advisory powers simply, and to recommend investigations of various kinds to the Secretary.

The prevailing opinion in the Association and among the medical profession, continued to be that the time had not come for urging the establishment of any form of national health organization; that there was great danger that if it were created the appointments would be made for political reasons, and that it was better to encourage the formation of State and local boards of health and wait until the people were educated up to seeing the importance and usefulness of such institutions.

In 1878 the quarantine question again came to the front, and a law was enacted by Congress making it the duty of consular officers to inform the chief of the Marine Hospital Service of the date of departure and port of destination of any vessels leaving any foreign port where contagious or infectious diseases exist, for any port in the United States.

The Surgeon-General of the Marine Hospital Service was charged with the execution of this act, with framing quarantine rules and regulations under it, and with issuing weekly bulletins of information collected by him.

No funds, however, were appropriated for the purpose, and a proviso was inserted to the effect that his rules and regulations should not interfere with those of any State or local system—the result being that the law was practically a dead letter.

Close upon this came the yellow fever epidemic of 1878, the formation, at the expense of Mrs. Elizabeth Thompson, of a commission to investigate this epidemic; and the discussions by the American Public Health Association, in the latter part of November of that year, of so much of the report of this com-

mission as was then prepared. The resolutions adopted by the Association at the close of the discussion may be taken as representing the prevailing opinions of the time among sanitarians, and three of these I will quote:—

"3. That it is the duty of the general government to aid in the establishment of a practical and proper quarantine by all means in its power."

"5. That it is the duty of the general government to invite foreign nations to co-operate with it in the establishment of uniform and effective international quarantine regulations."

"6. That whatever may be the practical value of quarantine, there is no doubt of the importance and value of internal sanitary measures in the prevention or modification of epidemic yellow fever, and that this Association strongly urges upon State and municipal authorities the great amount of responsibility which rests upon them on this account at times when no disease is prevalent or threatening."

As soon as Congress met in the following December, special committees on epidemic diseases were formed in both House and Senate, and the fact that such committees were found necessary is sufficient evidence of the slight attention which had been previously given to the subject of public health by Congress.

A second yellow fever commission, composed of members of the House of Representatives, Senators, and physicians, including those who had been engaged on the work of the previous commission, was created, and proceeded to visit those places where the epidemic had prevailed, and to collect the opinions of the physicians of those localities as to the causes of the spread of the disease, and the best methods of preventing it.

Before the report of the commission was complete, several bills relative to quarantine were introduced, of which the one presented by Senator Lamar, of Mississippi, may be taken as a type. This bill created a department of public health, abolished the office of Supervising Surgeon-General of the Marine Hospital Service, and provided for the appointment of a Director-General of Health, to be in charge of the department, and also of the Marine Hospital Service, who was to make and enforce all quarantine measures and regulations for the prevention of epidemic diseases, or to limit their spread. He was to receive a salary of $7500 per annum, and only to be removed from office upon a hearing before the Chief Justice of the United States.

The proposal to thus confer almost autocratic power upon a single man met with very general disapproval among sanitarians and medical men throughout the country.

In January, 1879, the executive and advisory committees of the American Public Health Association issued a memorandum upon the legislation then pending in Congress relative to the public health, in which objection was made to any national legislation upon quarantine until more information should be obtained.

It was recommended that Congress should at once provide for the organization of a national health commission, whose duty it should be to report to Congress, at the next session, a plan for a permanent national public health organization to take charge of any investigations into the causes and means of prevention of yellow fever, or other epidemic disease, which might be referred to it by Congress, and that said commission should not be burdened with any administrative duties not connected with the investigation referred to, nor should it be dependent upon or connected with any existing bureau or department of the government.

It was urged that the future of public hygiene in this country depends mainly upon the proper organization of State and local boards of health, and upon such recognition of their importance and utility by the people and their legislators, that the necessary means and powers shall be granted to them to enable them to properly perform their duties; that the general government can do much to stimulate and encourage the formation of such boards; and that an important part of the duty of the national health commission would be to point out what can best be done to forward this object. "Such boards can do good work, not only for their own locality, but for the nation; and, if the nation will pay for this work, it will be most cheerfully done, especially if a proper central health organization be arrived at with which they can co-operate, as we hope and believe will be the case, if the plan suggested be carried out."

A few weeks later the Congressional Yellow Fever Commission presented its conclusions, recommending quarantine, and the formation of a chief health authority at Washington to supervise it. The result of this was the reporting of a bill by Senator Harris, of Tennessee, chairman of the Senate Committee

on Epidemics, which bill created a bureau of public health, having no duties other than those relating to quarantine.

It also created the office of Director-General of Health, who was also to have charge of the Marine Hospital Service; but in connection with him there was to be established a board of health, to consist of seven members, to be appointed by the President, and of the Surgeon-General of the Army and Navy, respectively. The Director-General of Health was to be *ex officio* president of the board.

This board was to frame rules and regulations for quarantine, and in case the health officer at any port appointed by local authority refused to adopt and observe these rules and regulations, or in the opinion of the board of health neglected or failed to do so, then the Secretary of the Treasury was to appoint a health officer of the United States for such port to carry out such rules.

This bill was quite as objectionable to the great majority of sanitarians as the Lamar bill, and met with so much opposition, both from this quarter and from those especially interested in State rights, that although it passed the Senate it was defeated in the House.

In the mean time, Mr. McGowan, of Michigan, after consultation with some sanitarians, introduced a bill just at the close of the session to establish a national board of health, and although this was strongly opposed by the Surgeon-General of the Marine Hospital Service up to the very last moment, it passed both House and Senate in the final hours of the session and became a law.

This act created a National Board of Health, to consist of seven members appointed by the President, one medical officer of the army, one medical officer of the navy, one medical officer of the Marine Hospital Service, and one officer from the Department of Justice.

The duties of the board were to obtain information upon all matters affecting the public health, and to advise the several departments of the Government, the executives of the several States, and the commissioners of the District of Columbia, on all questions submitted by them, or whenever in the opinion of the board such advice may tend to the preservation and improvement of the public health. It was also directed in conjunction with the National Academy of Sciences to report to

Congress a plan for a national public health organization, giving special attention to the subject of quarantine, and consult with the principal sanitary organizations and sanitarians of the several States of the United States with regard to the matter.

Under this act the present National Board of Health was formally organized on the 2d of April, 1879.

In the mean time Congress had convened in extra session, and the representatives from the Southwest had insisted upon the necessity for national quarantine.

Accordingly, an act was passed, approved June 2d, to prevent the introduction of contagious and infectious diseases into the United States—in other words, a National Quarantine Act.

Besides its quarantine features, however, this act authorized the board to publish a weekly bulletin of the information and vital statistics collected by it, and made it the duty of our consular officers to furnish weekly reports as to the health of their stations.

The operations of the board under what may be called its constituting act are not as well known as they should be, which is in part due to the fact that the board has not been able to obtain authority to print the full report of the investigations which have been made under its directions, and of its operations in an educational point of view. The most important of these have been:—

1st. The inquiry as to the best form of a national sanitary organization.

2d. An investigation into yellow fever in Cuba.

3d. The making prominent, both by precept and example, of the importance of sanitary surveys, with instructions as to methods.

4th. Investigation on water and air analysis, on the operation of sewers, on food and drug adulterations, on diphtheria, on disinfectants, etc.

Time is wanting to give any details of this work, but I must allude to the conclusions as to the best form of a national sanitary organization for this country. After conferences and correspondence with the principal sanitary organizations and sanitarians of the country, and with a number of our most prominent scientific men as represented in the National Academy of Science, the opinion was found to be almost unanimous that for the present the existing form of the National Board of Health

is as good as any, and that no change in it should be made until the desirability for such a change becomes much more apparent than it now is.

In accordance with the law which created it, the board, in conjunction with the National Academy, advised Congress to this effect, recommending that for the present no change be made in the plan of organization of the board; that it should continue the special investigations already commenced; and that, in addition to these, investigations should be undertaken by it or under its direction, upon the subjects of cholera, malaria, typhoid and typho-malarial fevers, diphtheria, and cerebro-spinal meningitis, and that it should also carry on sanitary surveys of places remarkably unhealthy or liable to become so.

It was also advised that the Board should take steps to secure as far as possible throughout the country, uniformity in the methods of collecting and reporting vital statistics; and that to this end it should call a convention of representatives of the United States, State and local authorities especially engaged in the collecting and reporting such statistics, with a view to securing agreement upon this subject.

This recommendation has been carried out, and the convention met at Washington on the 6th and 7th of May last. It adopted provisionally the nomenclature of the Royal College of Physicians of London, and appointed a committee to confer with the College, and more especially with its committee, which, it is supposed, is now engaged in the decennial revision of said nomenclature, with the view of obtaining, if possible, for all English speaking people, a uniform system. You are all aware of the attempts made by this Association, a few years ago, to make an improvement upon this nomenclature of the Royal College of Physicians, and of the fact that the whole matter was finally tabled and led to nothing.

The proposition which is now made by the National Board of Health and by the convention called by it, is to adopt provisionally this nomenclature, as far as it goes; leaving every one when he meets with a case which is not fairly represented in this list, to select such name as may seem good to him; and to endeavor to co-operate with the college in revising and making additions to the nomenclature to correspond with the additions of modern pathology, and ultimately to organize some form of

standing committee for this country, which shall join with the college in revisions at stated periods.

It is very desirable that this Association should interest itself in this matter, and should appoint a committee to co-operate and advise in the revision proposed, and I would suggest that a resolution should be reported from this Section to the Association for the appointment of a committee for the purpose of co-operating with the two committees above referred to, and with the National Board of Health, in regard to these matters.

The convention also took steps to secure uniformity in the forms of certificates of births, deaths, and marriages, and in the methods of recording and tabulating these, which in due time will probably lead to improvements in the vital statistics of the country.

The preliminary report of the Havana Yellow Fever Commission is, no doubt, familiar to all. The most important part of this work was to destroy a large number of unfounded theories, and to clear the ground for future work in definite directions, such, for instance, as has been pointed out by Dr. Woodward in his report on the Histological Pathology of Yellow Fever, published by the board as Supplement No. 4 to the Bulletin.

Advancement in this direction can only be hoped for from specially trained observers, and the board proposes to take steps to have at least one observer properly fitted for this purpose to continue the research. In the mean time researches are now being made by the aid of photomicrography in New Orleans with regard to suspended matters and minute organisms in the air of that city and the marshes of the vicinity, and these photographs will be compared with other photographs, collected in like manner, if the fever appears at that point or vicinity.

The investigation into the flow of sewers, made at the request of the board, by Col. Geo. E. Waring, has already had the important practical result of leading the authorities of Memphis to accept the system of sewerage which was within their means as adequate to the wants of the city, instead of a system which would have cost nearly five times as much. The investigation now in progress as to the best methods of determining both quantitatively and qualitatively organic matters in the air under the direction of Prof. Remsen, of the Johns Hopkins University, is also one from which in the future important results may be hoped for.

Thus far the work has mainly been in the nature of criticism showing the unreliability of methods of analysis heretofore used. During the coming year it is proposed by the board to undertake investigation into diphtheria and malaria, and more especially into the pernicious forms of malaria, and those accompanied by hemorrhages.'

Prof. H. C. Wood, of Philadelphia, is now engaged in a series of experiments to determine the possibility of communicating diphtheria to animals.

In all such investigations it should be remembered that negative results, when based upon a sufficient number of carefully conducted experiments by scientific observers, have in themselves a positive value, and limit the field to which future investigators may profitably apply their efforts.

Let us now review briefly the National Quarantine System, as established by the act of June 2, 1879, and the results which have been obtained by it. This act provides that no vessel coming from any foreign port where contagious or infectious disease exists shall be allowed to enter any port in the United States unless she has a certificate or bill of health signed by the consular officer of the United States at the port of departure. The National Board of Health is to make rules which, when approved by the President, will govern the forms and condition of giving such a certificate. The law left it to the national board to determine what should be considered as contagious or infectious diseases. Evidently, if these terms were used in their medical sense, there would be very few ports in the world which would not come under this law. The board, however, has decided that the only diseases which for the purposes of the act are to be recognized as contagious or infectious, are cholera, yellow fever, plague, small-pox, and relapsing and typhus fevers.

The intent of this part of the act was to confer great power on the board, but it failed in its object for two reasons.

The first is that it was accompanied by a proviso that no vessel should be subject to the penalties imposed by the act unless the rules prepared by the national board, and approved by the President, should have been officially promulgated at the port of departure at least ten days before her sailing. Such official promulgation, however, cannot be made without the consent of the authorities of the place, and in Cuba this consent was refused.

The second cause of failure of this part of the act was due to the fact that to render a vessel liable to its penalties it was necessary to prove in court that contagious or infectious disease actually existed at the port at the precise date of sailing of the vessel—which proof usually could not be furnished.

In view of these failures the board, in conjunction with the National Academy, recommended additional legislation to the effect that all vessels coming from ports lying between certain parallels of latitude shall be required to furnish the certificate or bill of health, just referred to, irrespective of the existence of contagious or infectious diseases in such ports, or of the official promulgation of the rules of the board in such ports.

It also advised legislation to authorize the President of the United States to call an International Sanitary Conference, to which the several Powers having jurisdictions of ports likely to be infected with yellow fever should be invited to send delegates for the purpose of securing an international system of notification as to the actual sanitary condition of ports and places under the jurisdiction of such Powers, and of vessels sailing therefrom.

The object of the conference was thus limited, instead of making it to secure an international system of quarantine, for the reason that the United States could not undertake to enforce any international system of quarantine, properly so called, since to do this it must override State and local legislation on this subject, and guarantee that vessels should be allowed to enter any port in this country irrespective of its quarantine laws.

This recommendation of the board has become a law, the word cholera being inserted in addition to yellow fever, and it is to be hoped that this conference will lead to very important practical results.

This act of June 2d also directed the board to aid State and local boards of health in carrying out their quarantine regulations, and provided funds for this purpose. If the quarantine rules of the local boards are not sufficient, the national board may make additional rules, which, when approved by the President, must be enforced by the sanitary authorities of the States, or else the President may detail an officer to do it for them. This, however, does not give the board the slightest power towards what may be called forcing intercourse.

That is to say, after all its rules have been complied with, it

has not power to assure to any vessel, steamboat, or train of cars, that it will be allowed entrance to any given port or place, since the local authorities of such port or place may enforce additional rules, even to non-intercourse, at their discretion.

It is probably unnecessary to remind you of the operations of the board under this act during the last summer. Through the assistance given by it to the State boards of health of Tennessee, Arkansas, Mississippi, Louisiana, and Illinois, and in a less degree to Texas, there is no doubt that the progress of the epidemic last summer was greatly restricted, and that commercial intercourse was kept up under circumstances which, in the absence of such aid, would have prevented travel and traffic to a great extent.

I will only allude here to the effects of the work of the board on the traffic of the Illinois Central Railroad, a note on which will be found in the Bulletin, of May 15th. From this it appears that the tonnage received and forwarded by that road at Cairo, Ill., for the last six months of 1878 and of 1879, was respectively 267,411,200 and 367,869,800 tons; forwarded, 87,300,600 and 129,833,800 tons.

The great difference in favor of 1879 is more than can be ascribed to increase of trade, and is largely due to the different quarantine regulations in force. In 1878, there was practically an exclusion of everything from the South, while under the inspection system of 1879 only dangerous articles were excluded. Dr. Rauch, the Secretary of the Illinois State Board of Health, reporting this, says that "this result could not have been reached without the co-operation of the National Board of Health, and the utmost exertions and repeated assurances of its inspector, as to precautions along the Mississippi River, were required to allay the fears of the local authorities." As it was, though not a single case of yellow fever occurred in Illinois in 1879, one-third of the people of Cairo were ready for immediate flight from July to September. The statement of tonnage being for one railroad alone, which pays to the State seven per cent. of its net earnings, the amount gained by increase of trade was many times greater than the whole expenditure for sanitary purposes.

After an experience of one season under this quarantine act, the board, in conjunction with the National Academy of Sciences, and in accordance with law, advised "that the Na-

tional Board of Health, or, in the interval of its sessions in seasons of emergency, the executive committee, shall be charged with the duty of reporting to the President when any given city or locality is considered to be dangerously infected with contagious or infectious disease; and that upon the official publication by the President of such report, the transportation of goods or persons from the place thus proclaimed as dangerously infected, into other States, shall be forbidden under penalties to be imposed under the jurisdiction of the United States Courts, unless such transportation is carried on in accordance with rules and regulations approved by the National Board of Health."

The object of this recommendation was to induce local authorities to refrain from declaring quarantine, often unnecessarily, by fixing the responsibility of declaring when such quarantine was necessary upon the National Board and the President. It was never intended to give the board more power, since it already has the power, with the approval of the President, to prescribe the minimum of precaution which shall be taken by any State against an infected place in another State.

When introduced as a bill in the Senate by Senator Harris, of Tennessee, opposition was made to it on the ground that it would interfere with State rights, and would confer a dangerous power on the national authorities. This opposition came mainly from medical men, whose solicitude lest local self-government should be interfered with seems to have been much greater than that of business men or politicians.

In a sanitary point of view it is unimportant, and the question is one that can best be left to business men to settle.

As regards maritime quarantine, it is proposed by the board to aid the ports of the South Atlantic and Gulf coasts, in a more systematic manner than heretofore, by the establishment of three or four relief stations for infected ships, to which vessels can be sent from the various Southern ports when found to be infected and to require treatment. These several ports, then, need only incur the expenses of a proper inspecting station and inspecting officer, while the stations established by the National Board of Health at Sapelo Sound, Hampton Roads, Ship Island, and perhaps at Galveston, can serve as general hospitals, so to speak, for the benefit of the numerous small ports which cannot afford the expense of constructing and maintaining a large station.

A complete quarantine station can hardly be established at a

cost of much less than $50,000, and to maintain it would require an annual expenditure of from $10,000 to $15,000 at least. Such a station has been compared to a fort. It may not be needed for several years, but when it is required it may in a single season save many times the expenses of its construction and maintenance. It is, however, hopeless to expect that the smaller Southern ports can each establish and maintain such stations, and it is just here that the aid of the national government can be most profitably extended.

Let us now consider some of the objections to the National Board of Health, and the practical difficulties which lie in its way.

In the first place, we have seen that its creation was in one sense premature. Forced into existence in an emergency, it was only to be expected that as soon as this emergency had passed it would find itself without the support of an educated public opinion, and upon such an opinion alone, under our form of government, can such an organization securely rest. The education of our people, however, sometimes goes on very rapidly, and this has undoubtedly been the case in regard to sanitary matters within the last eighteen months, to an extent which probably no sanitarian had anticipated. Although comparatively few as yet understand the organization or powers ot the board, or have any clear idea of what it has done or is trying to do, still there are a large number of physicians and scientific men who have become more or less interested in its operations and publications, and who would now prefer to see it improved rather than abolished. It was fortunately so composed that its members could hardly be suspected of political or personal motives; and although by a few persons it has been charged with grasping for power, it is tolerably well understood that this charge has no foundation, and that its main objects have been to promote original investigations, to collect information as to the condition of the public health, and to stimulate the formation of State and local boards of health, which should have as much real unquestionable authority as possible, and to aid them in their work in all possible ways.

It has also been fortunate for the board that it has had comparatively little patronage to dispense, and that it has so managed that the greater portion of this patronage has been made upon the recommendations of State or local boards of health; as it is, the pressure upon it for appointments to the half a dozen

clerkships and the ten or fifteen inspectorships it has thought proper to create, has made it some enemies among disappointed candidates and their friends.

The principal objections, however, to the National Board of Health and to the system of quarantine inspections and relief stations which it has proposed to inaugurate, are made on the ground of expense. These objections, as urged in the daily press, and by members of Congress, may be stated as follows:—

I. Every port or State ought to take care of itself, and furnish the means for doing it. The Northern States and cities do this, and do not desire any help from the general government. Why do not Southern ports and cities do the same? and why should the whole country be taxed to pay their local expenses?

The answer to this is that, as a matter of fact, they do not do it; that they probably cannot do it; and that the evil results of such failure affect not them only, but the whole country. The interest on the money which, during the last fifteen years has been raised by voluntary contributions in the North to aid Southern communities affected with yellow fever, would more than pay the expenses of the system of prevention which is proposed.

The second objection is this: Granting the utility of the preventive means proposed, and also that in the interests of commerce and of the national revenue, as well as of humanity, it is wise for the United States to furnish the means, cannot these means be supplied without creating a National Board of Health to control them? A board is a cumbrous and costly institution, and although its members may be scientific, that rather makes it improbable that they should be good business men, or possess executive ability?

The reply is that the national board was not created to disburse funds for quarantine, but to do much more difficult and important work, as I have tried to explain in this paper. But having such a board, it seems more proper to refer to it such work, connected with quarantine, as the general government may undertake than to send such work to some other bureau. This, however, is a mere detail as to executive work; the point is that the board has other work to do, and that its utility does not depend solely or even mainly on its quarantine work.

I have said above that the creation of the board was premature, in one sense; I mean by this that our legislators, when they created the board, did it for quarantine purposes, and not

for the true purposes of a sanitary board, and they measure its utility solely with reference to its power to prevent the entrance or spread of contagious or infectious disease. The very title of the act which created it is misleading. It is called "An Act to prevent the introduction of infectious and contagious diseases into the United States, and to establish a National Board of Health;" but a very slight examination of this act will show that it has nothing to do with preventing the introduction of infectious and contagious diseases, or, in other words, with quarantine.

I have elsewhere expressed the opinion that the remedy for the evils connected with local quarantines, as they have heretofore been managed, is "the education of the people until they shall know what amount of restriction is really necessary to insure safety, and it seems, on the whole, expedient that the cost of this education should be borne by the general government. It follows, therefore, that the United States should for a time bear a much larger proportion of the expenses of a quarantine system than it will need to do when the States and municipalities are equally well informed as to their duties, and as to their true interests."

What shall we say as to the future of this National Board of Health? For a premature birth, the infant seems healthy and lively, but it would be rash to make any prophecies as to its immediate future, since this depends so largely upon the contingencies of the next few months.

There still prevails over a large section of the country, and in the minds of many of our legislators, the idea that the main purpose and use of the board is to prevent the entrance of yellow fever into this country, and that, if yellow fever does appear here, it shows that the board is useless. Until this idea is changed, and the public obtains a much broader conception of the field of labor of a national health organization, the very existence of the board hangs upon a slender thread, for until we know much more of the nature of the cause of yellow fever and its methods of propagation than we now know, it is probable that this disease will continue to appear whether we have a national board or not. If it depends exclusively on importation, it will at times pass any quarantine system which now exists in this country, or which is likely to exist for a long time.

All that any system can effect with our present knowledge

is to prevent its entrance nine times out of ten; but this is well worth striving for. If yellow fever depends on local sanitary conditions, there is little hope that these will be done away with in many of our Southern cities and towns for years to come. By properly constituted and intelligent State and local boards, stimulated and aided by the national board, no doubt much may be done to prevent the origin, and limit the spread of this disease, and if the co-operation of other powers of the intertropical Atlantic can be obtained, its field may be restricted within very narrow limits.

Under existing laws, and in the prevailing state of public opinion, it is a necessity that the national board should give special attention to quarantine matters, and much the greater part of the funds under its control have been granted for that purpose only. But in common with all intelligent sanitarians and physicians the board sees clearly enough that its most important fields of usefulness lie in other directions, and it has done enough already in those fields to make it probable that hereafter this country will not be without some central sanitary organization irrespective of the question of a national quarantine system.

That this organization will remain permanently in the form of the present National Board of Health is improbable. The tendency just now is towards the plan sketched by Dr. Bowditch, involving a representation of all State boards in a general council, with a single executive officer to be chosen by the council; but there are many practical difficulties in the way of this plan. To make it effectual, concurrent legislation on the part of the several States and of the United States will be necessary, and a very extensive educational process must be gone through with before such legislation can be secured; and it seems to me that one of the first steps in this process is to show what the sanitary condition of our cities, towns, and villages actually is, which is to be effected by a uniform system of vital statistics and by sanitary surveys.

In conclusion, permit me to repeat what I have elsewhere said in this connection:—

"In sanitary matters no single man, city, State, or nation can protect itself, except by non-intercourse, and not always even by that. To get the best results with the least cost and interference with freedom, we must help one another; but this help

must be given, received, and regulated on business principles, 'because it will pay,' and not be considered as sentimental charity, which will sooner or later be grudgingly bestowed and unthankfully received. We want our citizens and cities, counties, and States to take care of themselves in sanitary as in other matters as far as possible; but there should be some power competent to interfere in the exceptional cases in which selfishness, ignorance, or terror leads either to danger of pestilence or obstruction of commerce. This power, however, cannot be established arbitrarily, or in advance of sufficient education of the business portion of the community to create a powerful public opinion to support it. Whether it is possible to supply this education otherwise than through the lessons which epidemics themselves give is the problem which the sanitarians of this country are at present practically trying to solve."[1]

[1] International Review, Jan. 1880, p. 49.

THE DEATH-RATE OF THE RICH AND POOR.

By CHARLES ROBERT DRYSDALE, M.D.,
LONDON, ENGLAND.

It has for many years appeared to me, whilst acting as medical officer to various London charities, that a vast deal of the sickness and death of the poorer classes is almost entirely due to the unfortunate position in which many of them are placed with respect to food, dwellings, clothing, and other requisites of healthy existence. In newer countries, like the Western States of the American Union, and in our Australian colonies, where the climate is suitable for the constitution of races of European, and, for the most part, of British origin, I presume, if I may judge from the statistics of New Zealand and Victoria, Australia, that poverty is not wide-spread, and hence that it does not greatly influence the death-rate, as it does in London.

I have no doubt that the same observation has been very frequently made by all medical men who have seen much of the poorest classes; but, in my opinion, there has, up to this time, been too little of accurate statistics collected to enable the medical world to see, what I am now inclined to believe is the case, that poverty, caused by low wages, is in all old and civilized countries by far the most important cause of premature death, and the main obstacle to all sanitary improvements.

It is doubtless quite true that, during the past three or four centuries, a very great advance has been made in lowering the death-rate in European states, a statement which will be amply verified, when it is known that in the town of Geneva, in the sixteenth century, the probability of life, or the age to which half of the population born lived, did not exceed 5 years, whilst the mean life was $18\frac{1}{2}$ years. In the eighteenth century these figures had risen to $27\frac{1}{5}$ years for the probability of life, whilst the mean of life had advanced to $32\frac{1}{5}$ years. England has had a similar history of a rapid fall in the death-rate during the

earlier decades of this century; but it must be confessed, that for the last thirty or forty years there has been no very perceptible fall in the mortality, and this in the face of the fact, that at no previous period in the history of the nation has there been such an amount of capital, labor, and intelligence expended on the drainage and purification of our cities.

Let me take London as a sample. With all the advances recently made in this wonderfully healthy city, we find that the death-rate was 22.2 per 1000 in 1856, 22.3 in 1876, and about 23 per 1000 in 1877 (Vacher). And if we turn to all England, we see, as Dr. Fergus pointed out at the Cork meeting of the British Medical Association, that the death-rate of England and Wales was identically the same, namely, 22.35 per 1000 in each of the decades 1841–50, 1851–60, and 1861–70.

The point that I shall endeavor to insist upon and elucidate is, that the grand cause of the non-improvement of our mortality resides in the mass of indigence, which is now, as it always must have been, the main cause of premature death, in all settled and civilized states.

M. Villermé, the distinguished Parisian physician, and several of his able collaborateurs, in the *Journal d'Hygiène Publique*, have contributed some valuable facts to this argument. Thus, in France, it has been observed that persons between the age of 40 and 45 die, if in easy circumstances, in the proportion of 8.3 per 1000, whilst if poor they died at the rate of 18.7; that is two and a half as many poor as rich died at these ages. It was found, too, that in Paris there died between the years 1817 and 1836, 1 inhabitant in 15 in the 12th arrondissement, which, as those of us who have studied in the Quartier Latin know, is peopled in great part by the poor, whilst but 1 death in 65 took place in the 2d arrondissement, chiefly inhabited by the richer classes.

M. Joseph Garnier, of Paris, mentions that in 1857 the mean life in certain quarters in Manchester was only 17 years, whilst that of other quarters of that most unhygienic city was then 42 years: and Villermé found, some thirty years ago, that the probable life of the infant of a weaver at Mulhouse was so low as only $1\frac{1}{2}$, whilst that of the child of the manufacturing class of that city was 26 years.

The venerable Mr. Edwin Chadwick, late chief officer of the first general Board of Health in England, kindly gave me, in

Paris last summer, a pamphlet of his, written in 1877, on the Dwellings of the Wage Classes, marking for me the following passage:—

"A death-rate which is a mean of the death-rates of the whole population, is almost invariably a pernicious representation. Thus we have part of a sub-district in London, comprising houses in good condition, where the death-rate does not exceed 11.3 in 1000, whilst there are adjacent dwellings within the same sub-district where the death-rates rise to the extent of 38 per 1000, from year to year. A mean of the two is a misrepresentation of the condition of both. It is now reported that there are particular localities in London, where the death-rates are from year to year upwards of 50 per 1000." He then refers to an important return made by the Sanitary Commission in the metropolis, in 1843, in which year the general death-rate was 24 per 1000. "A study of the common form of return of the proportion of deaths to the living of all classes, will show how little useful information was to be got from it, in comparison with the return for the same year subjoined:—

	Proportion per cent. of deaths from epidemics to total deaths of each class.	Proportions of deaths of children under 1 year to births within that year.	Proportion per cent. of deaths of children under 10 years to total deaths of each class.	Mean age at death of all who have died, men, women, and children.	Mean age of all who died over 21.
Gentry, professional persons, and families	6.5	1 to 10	24.7	44	61
Tradesmen, shop-keepers, and families	20.6	1 to 6	·52.4	23	50
Wage class, artisans, laborers, and families	22.2	1 to 4	54.5	22	49

These admirable statistics might seem almost sufficient to prove my point, that indigence, or low wages, is the grand cause of early death; but the more recent statistics assembled by Mr. Charles Ansell, and published by him in 1874, are to my thinking still more trenchant, seeing that they are accompanied by so many interesting details. Mr. C. Ansell, Jr., in his capacity of actuary of the National Assurance Company, went, some years ago, through the immense labor of obtaining information, through circulars sent out from his office, concerning no less than 48,044 children of the well-to-do classes in England, including members of the legal, clerical, and medical professions,

and the nobility and gentry. In 1874 he published his remarkable work, entitled, "Statistics of Families of the Upper and Professional Classes," from which I will now make a few extracts bearing upon my thesis.

This gentleman points out that it results from his figures that, in the first year of infantile life, only 80.45 per 1000 deaths occur among the children of the richer classes in England. In the Registrar-General's Report it is shown that about 150 per 1000 die in the general population of England; and we find that that rate rises to 188 per 1000 in Liverpool, so that it can easily be understood that the death-rate among the most indigent classes in our large towns is often three or four times, in the first year of life, over that of the easy classes.

Dr. Stille, of Hanover, in an article on the infantile death-rate in some cities in Germany, shows that it is occasionally as high as 500 per 1000 in Berlin, a city in which the poverty of the worst-paid classes is extreme.

Mr. Ansell next shows that from 1 till 5 there are 46.84 deaths per 1000 among the children of the richer classes in this country, as against 113.69 in the general population.

Of 100,000 births, Mr. Ansell's tables show that among the easier classes there are 80,000 survivors at the age of 21, as against 65,750 among the poorer classes. His tables also show that among the richer classes, between 40 and 60, 147.74 per 1000 die, as against 168.76 of these ages in the general population, as disclosed by the Registrar-General's Reports.

The mean age at death among the richer classes in Ansell's tables appears to be 55 years at present, an estimate a good deal higher than that already quoted from the Report of the Sanitary Commission in 1843, namely 44. His tables also show that of 100,000 children born among the well-to-do, 53,398 survived at the age of 60, whilst in Farr's tables only 36,983 attained that age.

One statement of Mr. Ansell's, which I noted when his work appeared, shows the supreme importance of being born of parents in comfortable circumstances. It seems that, in the year 1873, there died in England and Wales 368,179 persons under the age of 60; and Ansell calculated that if the mortality among the general population had been only what it was in the upper classes, 226,040 would have died. So that, in one year poverty destroyed 142,130 lives in England and Wales alone.

A remarkable confirmation of this calculation of Mr. Ansell's has quite recently been afforded from the official statistics of New Zealand. The wages of labor and the profits of capital have been for some years very high in that country, the price of butcher meat is but 3*d.* a pound in many parts, and the most unskilled agricultural labor is able easily to secure for the laborer plenty of food, clothing, and shelter for himself and family. Hence the amazingly low death-rate of only 12½ per 1000. This is, of course, mainly due to the absence of an indigent or badly paid class in that new colony. Had England and Wales that death-rate, some 220,000 lives would be saved annually.

In passing, I think this may perhaps show those persons who believe that alcohol is the great cause of most of our evils in this country, that they are a little exaggerating a useful truth. It is probable that the New Zealand laborer partakes of as much or more of his so-called luxury at the antipodes as he did when at home, and yet he lives nearly twice as long as he would in this country.

The greatest British writer on logic of our day, Mr. Alexander Bain, in an able essay on the Constituents of Happiness, has the following remark, which the statistics I have just cited amply verify: "That prime requisite, health, is very imperfectly secured in the lowest grades even of respectable citizenship. The public registers have demonstrated that mortality and disease diminish with every rise in the scale of wealth."

An able writer of hygiene, M. D'Espine, remarks in the *Annales d'Hygiène*, that the so-called mortality of several trades is only another name for poverty. Dr. Thouvenin, in an article on the influence of trade on health, arrived at the conclusion that, with the exception of cotton-beating, dividing and carding of silk cocoons, or white lead grinding, and one or two other trades, industrial pursuits do not exercise any directly injurious effects on the work-people's health. He traces the deterioration of the health of the wage classes in towns, and their greater death-rate, to defects in their dwellings, to hereditary and skin diseases, to venereal and tubercular diseases, to the excess of their premature toil, and the scantiness and bad quality of their diet, the irregularity of their lives whilst still immature, and, lastly, to drunkenness.

The summary of these causes is but another way of naming poverty; and D'Espine shows also, what my own experience as

physician for many years to the North London Consumption Hospital had led me to conclude, that, whilst tubercular diseases form 68 per 1000 of all the deaths among the richer classes, no less than 230 per 1000 of the poor die of these diseases so often caused by mal-nutrition during childhood.

Dr. Edward Smith, whose untimely death hygienic science so deeply deplored, in this point, put a number of questions to 1000 patients of his with phthisis, and found, what my own statistics have tended to confirm, that the average number of children given birth to by the parents of the consumptive patients was 7.5. It can readily be seen how their patients become consumptive, when we consider how ill-fed they often must have been where there were so many mouths to fill on the low wages of our laboring classes.

That eminent observer also threw further light on the way in which poverty caused premature death in the Sixth Report of the Medical Officers of the Privy Council for 1863. In an article on the "Food of the Laboring Classes," Dr. Edward Smith stated as the result of his laborious inquiries that the food of the workers in silk was found to cost per head only 2*s.* 2*d.* a week; that of the needle-woman, 2*s.* 7*d.*; of kid-glovers, 2*s.* 7½*d.*; and of stocking-weavers, 2*s.* 6½*d.* He sums up by saying: "No class under inquiry exhibited a high degree of health. The least healthy are the kid-glovers, needle-women, and Spitalfield weavers. The average amount of food was too little for health and strength."

I am glad to think that some able members of the profession are commencing to talk of this point. Thus, at the Cork meeting of the British Medical Association, I find Dr. Rabaghati, of Bradford, quoted in the Journal as having said: "It was common to hear of large families, of whom nearly all or more than half died in infancy. Among the poorer classes, especially, this was generally the case. Instances of it came before him every day."

Poverty, then, I trust I have sufficiently proved by these figures, is the main factor of premature death in old countries, such as those of Europe. If, then, we desire to lower the death-rate in any notable degree in this country, I submit that we must no longer content ourselves with drainage schemes or charitable plans for building model houses for a few who are to live in them with the assistance of the rate payers. I presume that all

who are penetrated as I am, with the weight of these figures, will at once admit that in order to permanently lessen the death-rate we must find out how to lessen that poverty which meets us face to face at every turn, even in our wealthiest States. How this is to be accomplished is not for me to say at this moment. Suffice to say that the diagnosis has been made. The cause of poverty has long been known.

The real cause of the difference in the remuneration for labor and the cost of butcher meat in this country and new colonies, such as New Zealand, exists solely in the much diminished pressure on the powers of agriculture in Europe as compared with such new colonies. Thus, although the birth-rate in New Zealand is at present 41 per 1000 as compared with 36 per 1000 in this country and 26 per 1000 in France, the death-rate is not much more than one-half what it is here. If, then, we were to lessen the birth-rate in this country down to the rate of France, continuing our present emigration, the price of provisions would ere long be as low here as in the newest colony. Our death-rate would then rapidly sink, and might eventually be as low as 12 per 1000, which is already the normal death-rate among the well-fed and well-housed classes in England. My argument is that our farm is overstocked with human animals; that this is the real cause of the permanent death-rate of our cities: and my contention is that so long as the population of England and Wales, and the United Kingdom, continue to add to themselves as great an increase as it did in 1877 (362,932), it is useless to expect much from drainage schemes or the other departments of public hygiene. *Slums* will always exist so long as people have low wages, and cannot afford large houses in which to lodge their numerous progeny which is so universally met with among the poorer classes in the United Kingdom. For, in almost all countries, the fecundity of the poorer classes is very much greater than that of the rich. In Paris, for instance, according to the *Statistics of European Population*, the births are but one-thirty-second of the population in the rich quarters, whilst in the poor quarters they rise to one-twenty-sixth. The poorer classes being less educated, are always less prudent, more instinctive,[1] and

[1] In France the members of the medical profession are remarkable for the extreme prudence they show in the matter of the size of their families. In 1878, when Vice-President of the First Section of the International Congress of Hygiene at Paris, I discovered that the most illustrious members of the Faculty of

consequently are cut off in what in modern scientific jargon has been styled the struggle for existence; a struggle which, however interesting it may be for philosophers to contemplate among other races, I humbly submit is contrary to all the instincts of the medical art and true morality to rest content with.

I conclude, then, that the only certain way to lower the death-rate *in Europe*, is to slacken the birth-rate until such time as butcher meat and wheat are as cheap here as in the most fertile of our colonies.

The moral of all I have said is as follows, in the words of John Stuart Mill: "Little improvement can be expected in morality until the production of large families is regarded in the same light as drunkenness, or other physical excess;" this observation, of course, holding true only for Europe, Asia, and the over-peopled States of the Republic of the West.

Medicine of Paris have not two children on an average in their families. Of 61 medical men, including Velpeau, Nélaton, Trousseau, etc., I found 109 children, *i. e.*, not two each. And it is well known that *in France* no customs dangerous to the health or life of the mother or to the sanctity of human life prevail. I wish I could say that we hear equally good reports from Boston or New York, or other of the long-peopled cities of America.

THE RELATION OF THE MEDICAL AND LEGAL PROFESSIONS TO CRIMINAL ABORTION.

BY EDWARD H. PARKER, M.D.,

NEW YORK.

WITHIN a few years, in one of the counties of the State of New York three cases of attempts to produce criminal abortion have been brought to light, and I propose to make them the occasion for some observations upon the relations of the two professions of medicine and law to this crime.

CASE I. A physician was called to see a young unmarried woman suffering from a profuse uterine hemorrhage. On his inquiring as to what was the matter, she at once said she was having a miscarriage. What brought it on? Dr. —— operated for the purpose. Her lover also said that he took her to the doctor's office, and paid him for his services. The operator had left town, and so she had to be cared for by others. The medical attendant at once put himself in communication with the proper law officers, and followed their directions. The girl recovered. Her affidavit was made as to the facts in the case; the doctor and the lover were arrested; a hearing was at once given them before a justice. The counsel for the accused was allowed to bully and coax the girl into a series of statements entirely different from those of the affidavit, and the accused were at once discharged.

CASE II. A woman, supposing herself to be pregnant, submitted to an operation by an ignorant and blind woman for the purpose of producing an abortion. Immediately after the operation the patient complained of intense abdominal pain, was nauseated, grew rapidly worse, and died in four days. A coroner's jury (the coroner was a medical man) heard the evidence of another woman who was present at the operation, and saw a

metallic instrument passed under the bedclothes and soon withdrawn covered with blood, and who also was with the patient till she died; heard the evidence of the physicians who made the post-mortem examination that there had been no pregnancy, and that the fundus of the uterus had been perforated by some instrument which caused a fatal peritonitis; and brought a verdict in accordance with these facts. The coroner committed the operator. The grand jury brought in two indictments against her. When the indictment came to trial, the woman who was present at the operation did not happen to be in the court room, though she arrived a few minutes later, and the judge ordered the prisoner to be discharged. Having been again brought to trial on the other indictment, her counsel argued that she could not be put in jeopardy of her life twice for the same offence, and the judge again ordered her to be discharged.

Case III. A young woman, finding herself illegally pregnant, had an abortion produced by a doctor. Being very ill and supposing she was about to die, she made an ante-mortem statement of the facts, and gave the names of the man and of the doctor. She finally recovered. Under the promise of immunity to herself and her lover they consented to give their evidence, and the doctor was tried, convicted, and sent to the State prison. Before half his term had expired he was pardoned by the governor—or rather, to use the language of the pardon clerk, the governor "commuted his sentence from four years to two years with deductions." The pardon clerk also writes as follows: "Both the judge and the district attorney have written favorable letters in the prisoner's behalf." Copies of these letters are in my possession, and the material points of them, for my present purpose, are as follows: The district attorney says: "Referring to yours of —— date, A. B. was convicted on the testimony of C. D., the girl upon whom the miscarriage was produced, and of E. F., who was the girl's friend, and was present when the operation was performed, and procured the same to be done. The girl was sick but a short time, but during her illness disclosed when, where, and by whom the miscarriage was produced. A. B. has been a physician in this city during my residence here, and for a long time before, and this is the first offence to my knowledge. He lived in the outskirts of the city and was rather a quiet man, and as I never had any occasion to

employ him as a physician, and never heard him discussed much, I cannot say anything about his character previous to his conviction, except that he was a peaceable, inoffensive, and orderly citizen. After his trial, and during his trial, he was very much affected, and appeared to me more than ordinarily concerned about his unfortunate condition."

The judge writes as follows: "A. B. is a farmer's son, with good abilities, and fair education. He somehow has got down in life, and is very poor. The person on whom he practised was a young girl. She suffered her condition to continue until a very advanced state of pregnancy, and then insisted on the abortion being procured, against the advice of the father of the child, against all representations of danger; and, notwithstanding the young man offered to marry her, she still insisted. The young man made application to A. B., and he, in an evil moment, yielded. The operation nearly resulted in the girl's death, but she finally recovered. I have not learned of any other offence against the doctor." After a brief reference to the convict's relations, the judge adds: "If the governor could see in this statement anything which would induce him to pardon the convicted person, I should be very grateful, as it will relieve people from a sharp disgrace, in some measure."

Now, if we analyze these cases in the relations of the two professions to them, we find that the medical profession is to be charged with two of the operations, but that it is to be credited with the efforts to bring all three criminals to justice. The legal profession is to be credited with a conviction in Case III., and to be charged with the escape of the guilty parties in Cases I. and II., as well as the discharge of the one convicted before he had served out half his term.

But let us examine these three cases a little more minutely. In Case I. the law officer, by including the doctor and the young man in the same indictment, closed the mouth of the latter, so that he could not be used as a witness. The only admissible evidence, then, was that of the young woman herself, and she was willing enough to shield both. It was no matter what she had told others; so long as she lived their testimony could not be used. The accused person in this case escaped by the blunder (whether stupid or adroit I cannot say) of the law officer.

In Case II., where the prisoner was charged with causing the

death of a woman—stabbed, in fact, just as much as if a dagger had been plunged into the body—the prosecuting officer was so heedless as not to have taken care that his principal witness was in court; and the judge did not consider it important enough to delay the business so long as is often done, when the dispute is only about the soundness of a horse.

Case III. is so plain that it goes to the jury, conviction follows, and the sentence of four years is the penalty; but when a year and a half had passed, the prisoner is liberated by order of one lawyer—who happens to be governor—and with the consent, if not recommendation, of the prosecuting officer and judge who tried him.

Now, it is not at all my intention to throw any blame upon governor, judge, or district attorney, personally. They are all men of ability and excellent standing, who cannot for a moment be supposed to be influenced by any unworthy motives; quite the contrary. But they are all lawyers, and seem to me fairly to represent the prevalent feeling of their profession as to this crime.

That position is apparently this—that the crime is against the mother mainly, if not entirely, and that the death of the fœtus in utero is an unimportant affair. The judge in his letter seems to make a point against the girl that "she suffered her condition to continue until a very advanced state of pregnancy," not remembering, perhaps not knowing, that she thus increased her own chances of recovery.

The district attorney also says, "the girl was sick but a short time" in a sort of apologetic manner. Nowhere does the destruction of the fœtus come into consideration, so far as we can judge.

This peculiarity of the legal profession arises, I apprehend, from the old notion of "quickening," as representing some mysterious change then occurring which places the child in a different condition. We know that the phrase "quick with child" occurs in different laws, and some penalties for crimes committed by a woman in the condition described by these words are delayed in their execution. This "quickening" is simply the recognition, by the mother or others examining her, of motion on the part of the child *in utero*. Feeble at first, the motion increases, till it sometimes seems as if the young child were about to leap into

the world through the thin abdominal walls rather than to wait for the more tedious passage *per vias naturales.*

The teachings of the medical profession are, under the more careful physiological studies of the last hundred years, that the old notion of quickening is absurd and false; that there is no time from the moment of conception to the moment of birth when the fœtus is not a human being; and that its life is as sacred at one period as at another. Quickening, which may occur earlier or later as the child is vigorous or not, also depends in a measure upon the sensitiveness of the mother to feeble motions, one noticing them earlier than another. A child that may not be killed the day after it is born, can no more properly be killed the day before it is born—unless it be to save the mother, who is in imminent jeopardy, and when no other course is practicable. Indeed, it is claimed by some that the living child *in utero*, whose passage into the world alive is impossible by the natural passages, has the right to have the mother's life imperilled by the Cæsarean section that it may have a chance of escape. But if the child may not be sacrificed the day before its birth can it be at any prior day? in the ninth month of gestation? or in the eighth month? or in the seventh? or when? From conception till the close of a life rounding its three score years and ten, physiology shows that the same individual exists, with no more distinctive periods which allow its life to be lawfully taken before birth than occur during its extra-uterine life.

The medical profession also knows that abortion or miscarriage, whether artificially produced or not, always places the mother in great jeopardy; and no one, I presume, ever assumes the medical charge of such a case without dread, and is peculiarly happy when the innocent woman can be told that she is out of danger.

Thus, then, the physicians as a body denounce this double crime, fatal if necessary to the child, and often proving to be so to the mother.

Thus, then, the lawyers, recognizing the peril to the mother, seem to think she may demand that the operation shall be done by taking upon herself the risk, just as she might decide to have a tumor removed, which by its growth might be inconvenient though not dangerous, if she were willing to risk the peril of the anæsthetic, and the other possibilities of erysipelas or septicæmia, and that the operator in either case would be equally

innocent. The destruction, I might say the murder, of the child does not seem to be an item taken into consideration.

There is little doubt that the position taken by the lawyers is generally entertained by the community. Married as well as unmarried women apply to medical men to have an abortion produced with as much if not more readiness than they do to have a cancerous breast removed. Mothers will say that they prefer the life of the daughter shall be imperilled rather than have disgrace fall upon her. I have been told when refusing to do the operation on a married woman that I was too squeamish. A professional friend refusing to operate for a fee of five hundred dollars was told that it was a great loss to the community when Madam Restell died.

It is, therefore, desirable to make the enormity of the crime more generally known, that physicians, who as a body refuse to do this operation, may be protected from the temptation which the comparatively large sums offered, and paid too, very naturally hold out to them. Our profession is not a wealthy one, and a five hundred dollar fee, and much more twice that sum, for a few minutes' work, requiring no great amount of skill, has very great attractions. I think I may properly quote the experience of a distinguished professor of obstetrics, now dead, but held in kind remembrance by hundreds throughout the country. He told me that, when his first wife was very ill and he was poor enough, a thousand dollars were offered to him to do this operation. Said he, "I thought how many things this would enable me to get for my poor wife, who needed them, but which I could not buy, but thank God—and as he said this his lip trembled—thank God, I said no." Now this same temptation, recognized in the excuses for the convict in Case III., comes to many a young man just commencing to practise medicine, and to many an older man who has perhaps "somehow got down hill," and who have not Gilman's rugged virtue to defend them. Can we wonder that they yield?

While the whole tone of the medical profession as a body is against this crime, I see no other safeguards against its commission so likely to be effectual as a determined effort on the part of the courts to enforce the laws—which are, I am told, quite sufficient—and a rigid holding of the criminal to the full amount of his sentence. I pity the innocent friends of the criminal, but the possibility of bringing such disgrace upon them ought

to have deterred him from committing the crime. Let slackness in prosecution, or a ready throwing out of court for insufficient reasons, or easy access to gubernatorial clemency be characteristic of these cases, and the tempter will be still successful. But let the opposite to these characterize the crime, and they will do much to strengthen weak-kneed virtue.

My purpose in bringing the subject before this Association, eminently representative of the medical profession of this country, is to urge upon it, either as a body, or upon its members as individuals, a decided and continued effort to enlighten the community in general, and the legal profession especially, upon the enormity of the crime of fœticide. The peril to the woman, great as it is, is safely escaped by very many—exactly what proportion it is impossible to say—but an abortion is of necessity fatal to the child, and the number of human lives thus destroyed is enormous.

I therefore respectfully present the following propositions, urging their adoption by this Section and, if possible, by the whole Association:—

1. Abortion should never be brought on by the use of medicinal or instrumental means unless necessary to the safety of the mother in consequence of pathological complications.

2. The destruction of the fœtus in utero for any other reason, properly ranks with other forms of murder.

3. Abortion produced artificially always places the mother's life in jeopardy and thus becomes a double crime.

4. The severe punishment of the operator when possible, without any probability of executive clemency, is due in justice to the honorable members of the medical profession, and yet more to the community at large.

UNSANITARY ENGINEERING AND ARCHITECTURE.

BY A. N. BELL, A.M., M.D.,
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SANITARY Engineering and Architecture *should* imply the construction of works, facilitating and protecting the purity of air and soil, as the essential conditions of human health, under all circumstances. But it is the misfortune of modern sanitary science that engineers and architects have, for the most part, treated it as an innovation not to be regarded at all, or only in its grosser parts, instead of an effort to incorporate and elaborate it as the most important of all contributions to their art and science. Hence are to be found habitual negligence or practical ignorance of sanitary science in the attempted following of, or improvement upon, more enlightened ancient works, and consequent recurrence or aggravation of diseases, which properly executed sanitary works would wholly prevent.

The soil-drains of Rome and other ancient cities have been adopted by modern engineers as typical sewers—diverted to uses for which they were never intended; and soil drainage, the purpose for which the oft-cited cloacæ of the ancients were constructed, is well-nigh or wholly neglected.

While sanitary science has, for the last forty years, been enlarging its bounds by grasping the natural history of diseases, pointing out the nature of their causes, and the way they operate, exhibiting the vast extent of mortality from causes wholly removable; showing, by reason, experiment, and analogy, how life may be prolonged, health regained, and general happiness increased by the removal and prevention of the impurities of air, water, and soil, skilled engineers and architects—skilled in the arts which please the eye, and, for a time, flatter the pride of their admirers—habitually fail to recognize the presence of anything which they cannot see or feel: the diffusibility of gases, the emanations of organic matter in process of putrefaction, the permeability of material substances to moisture and gases, the

relations of the air and water to soils, sites, and structures are ignored as conditions unworthy the attention of those whose chief aim it is to be represented more by the magnitude and cost of their works than by their utility.

Forgetful or ignorant of the importance of distinctive and appropriate means for the collection and disposal of soil and surface water and sewage, modern engineers have generally adopted the plans of the ancients for the first of these purposes only as being equal to both, have accepted the great subterranean conduits of the ancients, or built others similar to them of *porous* material, fit only for soil drainage, as the ideal structure for the reception of, and—but not at all adapted to—the conservation and carriage of sewage. The consequence is that the substance of these conduits, the soil, and the houses connected with them, are pervaded with the *materies morbi* of unsanitary engineering; and the water carriage system condemned, because forsooth engineers have equally failed to profit by the arts of the ancients, and the science of physics. From the former they should have long since learned that other provision was made for the treatment of sewage by collection, precipitation, overflow and utilization in a totally different set of receptacles; and that refinements in this art, as compared with much of modern construction, may yet be learned from the revelations of that most renowned temple of wisdom, the Temple of Jerusalem. Moreover, tracings of this knowledge may be found all the way down through the ages of the most cultivated peoples, insomuch that, even in London, no longer ago than in 1815, it was a penal offence to discharge sewage or other offensive matters into the subterranean conduits. These were intended and built exclusively for the collection and carriage of soil and surface waters.[1] "Cesspools," not such in London as were the Pools of Siloam and the Fountain of the Virgin, which overflowed into and enriched the king's gardens in the valley of the Kedron, but such, nevertheless, as admitted of separate treatment and removal of sewage, and prohibited its flow into the potable waters of the populace.

The connection of house drains and the delivery of sewage into the soil drains of London with outfall into the river, was first made compulsory in 1847, at the very beginning as it were of modern sanitary science, and before the danger of this process,

[1] 35th Annual Report, Registrar-General, 1875.

which has in recent years involved millions of pounds sterling for its correction, was duly appreciated.

And from the latter, from a knowledge of physics and its application to sanitary science, engineers are inexcusable for not having practically learned that a subterranean conduit may be full to overflowing with invisible poisonous gases, and the more dangerous in the inverse ratio to the amount of visible sewage, not only filling the sewer, but saturating the porous material of which it is made and the contiguous soil. And, moreover, when thus filled with gas, subject to the compression arising from the inflow of storm waters, the blockade of rising tides at the outfall, or the force of the wind into the exposed mouths of such sewers at low water, no amount of trapping, no ventilation, no mechanical contrivances whatever, can effectually resist work so well adapted to the promotion of disease and death—so unworthy the name of *sanitary* engineering.

And fully of a piece with engineering in this regard is architecture. It may be true as recorded, that when the Arabs abandoned their tents and took to huts, consumption was among the first fruits of the change. But in so far as domiciliary residence is promotive of consumption—this greatest destroyer of the human race—it is extremely doubtful whether the filthiest hut ever tenanted by Arab, or cave by hermit, excelled the efforts of modern architects. For if to architects in general a knowledge of physics and of the most common causes of disease be conceded, it is apparent that most of the public buildings of our cities, such as hotels, insurance buildings, many churches, courtrooms, public school buildings, assembly halls of various kinds, some hospitals and many of the mansions of the rich, as well as the tenements of the poor, have been constructed with special reference to their deadly effects upon those who occupy them.

A knowledge of the composition and the common properties of the air is supposed to be among the acquirements of a common-school education; and reasonably, architects, if not indeed school commissioners, carpenters, and masons, ought to know something of building-sites, and the relations of the air and water to soil and building material; but that they really do not is to be inferred, else they are murderers. The hardest rocks only are perfectly free from, and impenetrable by air, while all softer stone, both natural and artificial, concrete, unglazed cement, brick and tiling, contain air, and when dry, freely permit

its transfusion. And soils, depending upon their nature, commonly contain from ten to fifty per cent. of air or other gases.

The nature of the air and other gases in soils and building material is of the utmost importance to human health.

Carbonic acid naturally exists in the atmosphere in the proportion of about four volumes per ten thousand. Any increase is detrimental to health, and double this proportion, or eight parts in ten thousand, long used, is dangerous. The well-recognized authority, Dr. Angus Smith, has shown by actual experiment that 10 parts of carbonic acid in 10,000 of air, or, what amounts to the same thing, 1 part in 1000, produced in fifteen minutes an increase in the number of respirations from 18 to 19 per minute, which increase remained the same up to forty-five minutes. The pulse was lowered in twenty-five minutes from 73 to 71 beats, while at forty-five minutes it was 72 per minute. With $2\frac{1}{2}$ volumes of carbonic acid in 1000 of air, the pulse, at first 70 beats per minute, increased to 73 at the end of ten minutes, and at the end of half an hour was lowered to 69; meanwhile respiration increased from 17 to 21 per minute. With 5 volumes of carbonic acid per 1000, the pulse at first 76, and the respiration 17, at the end of forty minutes were represented by the numbers 71 and 24.

But besides this effect of carbonic acid *per se*, which architects and engineers should have learned by common observation among operatives in mines and tunnels, an excess of carbonic acid in the atmosphere of any place is ordinarily accepted as an index of other impurities.

Pettenkofer,[1] Hartley,[2] Cunningham,[3] Nichols,[4] Chaumont,[5] and others,[6] have shown that in this regard, while all soils contain an excess of carbonic acid, none are wholly free from other impurities, while the emanations from many are well known to be highly dangerous.

Pettenkofer's investigations in this direction began in 1854, in his study of the cholera, but chiefly at that time with reference to the influence of ground water. But in 1870, in experi-

[1] Lectures delivered in Munich and Dresden: Translated by T. P. Corbally, M.D. The Sanitarian, vols. iii. and iv.; and by Augustus Hess, M.D. Popular Science Monthly, vol. xi.

[2] Air and its Relations to Life.

[3] The Soil in its Relation to Disease.

[4] Sixth Report Massachusetts State Board of Health.

[5] Lancet, 1873.

[6] Parkes' Practical Hygiene. Fifth Edition.

ments in the alluvial soil in the vicinity of Munich, he found that the proportion of carbonic acid increased with the depth, and that the amount varied with the season, being greatest in summer and least in winter.

As summarized by Professor Nichols, in the Sixth Annual Report of Massachusetts State Board of Health: "The largest amount at a depth of 4 meters ($13\frac{1}{2}$ feet) below the surface was 18.38 parts in 1000 (by volume);" or more than 45 times as much as in the normal atmosphere; "this was August 7. The largest amount at a depth of $1\frac{1}{2}$ meter (5 feet) was 14.15 parts per 1000; this was July 31. The smallest amount at a depth of 4 meters was 3.01, February 8; at a depth of $1\frac{1}{2}$ meter, 1.58, February 28." Subsequent determinations, in the vicinity of Dresden especially, under the direction of Professor Fleck, have shown that in some places at the same depths much larger proportions exist—one reaching the enormous amount of 80.63 parts in 1000, in October, 1873. Professor Nichols' own determinations in the Back Bay lands of Boston, show that at the depth of from $3\frac{3}{4}$ to $5\frac{1}{2}$ feet, about half the depth of ordinary cellars, the amount of carbonic acid varies from 1.49 to 2.26 volumes per 1000, and inversely as the height of the ground water. "The results" (of his investigations, he remarks) "are very similar to those obtained by Pettenkofer in the general soil at Munich." The bearing of these researches, and their relation to the subject under consideration, is best shown in the common practice of building deep cellars with porous floors and walls in foul soils. Many of the most costly buildings, public and private, in New York and other American cities, are over cellars more than twenty and some of them more than thirty feet deep, and in the midst of lots filled in with foul garbage. School-houses, with a thousand or more sittings, built by salaried architects, restricted to less than 100 cubic feet of air space for each person, are built over foul soil, perforated with leaky sewer and gas pipes, and sometimes honeycombed with old privy vaults and cesspools, with cellars from seven to ten feet deep covered with a single course of porous brick laid on mud without cement! Churches there are, built at costs, severally, of hundreds of thousands of dollars, which have their sacrificial altars laid deep down in soil indescribably foul; university and college buildings are in the same category, and these—all—as the school-houses, public offices, hotels, and the abodes of merchant princes, are furnished with warming

appliances of the most effectual kinds, and with no provision for ventilation, in many cases, except the windows, or such as is worse than none—air-shafts extending from the cellar with *inlet*-openings on every floor. They are surrounded by impervious sidewalks, and the streets in many cases paved with granite blocks or asphalt, and such as are not are subject to being frozen in cold weather. What is the state of the atmosphere in such structures under such circumstances? Aspirators—veritable cupping-glasses—the only means of exit by which the carbonic acid and other mephitic gases from soil loaded with impurities of every kind, finds a way of escape! The results may be learned by a study of the mortality statistics.

THE TEMPERATURE OF LIVING-ROOMS.

By R. C. KEDZIE, M.D.,

MICHIGAN.

THE temperature of the air in a room in which a person is engaged in a sedentary occupation is a matter of importance because it is intimately associated with comfort and health. The living organism requires very different conditions from those in which inanimate objects may be preserved in safety. It has been said, "heat is life, cold is death." If any inanimate object, *e. g.*, a bar of iron, is highly heated and then withdrawn from the source of heat, the temperature will rapidly fall till it reaches that of the surrounding medium, and will then fluctuate with the temperature of that medium. Not so with the human body, for it will maintain a nearly uniform temperature whatever may be that of the surrounding bodies. The fluctuations of temperature of the body as a whole are between 98° and 100° F. during health, and if the temperature of the blood falls much below, or rises much above, normal vital heat, disease and death are close at hand.

While the temperature of the body is nearly uniform, and usually high as compared with its surroundings, that of the air is ever fluctuating; and vigorous health is best maintained at a temperature much below blood-heat. In cold weather the difference between the temperature of the air and that of blood-heat is supplied either by heat supplied by oxidation and tissue changes within the body, or it must be supplied by heat from external sources. A certain amount of heat is produced by normal changes in the body, and if this is sufficient to make up the difference between the temperature of the air and blood-heat, the conditions of comfort and health will be fully met so far as temperature is concerned. But if the difference between air-temperature and bodily temperature is greater than can be supplied by the internal heat produced by normal changes

taking place in the body, then the deficiency must be supplied either by heat external to the body, or by heat produced by abnormal changes within the body, and the conditions of health and comfort will not be fully met. The mode of life which makes frequent demands for internal heat by abnormal tissue-changes, so far from conducing to vigorous health, is making an *inroad upon the capital stock of life, instead of simply expending the regular income.*

The amount of internal heat naturally produced in the body is a fluctuating quantity, varying somewhat with the temperament, but especially with the amount of muscular exercise. Where, for any reason, bodily activity is restrained, the air must be correspondingly warmed to insure the conditions of healthy living. This condition demands consideration in the case of children, invalids, and those who follow sedentary occupations; and it is for these classes that I bespeak a careful consideration of the *temperature of living-rooms.*

PHYSICAL EXERCISE.

If a large amount of heat is produced by active exercise, the external supply is of less importance; thus we may work in comfort in an atmosphere at frost-point. But if the person is sitting still, and especially if the sedentary position is enforced, then the air of the room must be kept up to a certain temperature to secure comfort and health, and the more complete the quietude of the body the more nearly must the air-temperature approach that of blood-heat. The margin of safety for each individual between air-temperature and blood-heat, is the quantity of heat furnished to that person by the normal tissue-changes occurring in his body, which varies with his activity. Thus a teacher walking about the room may find the temperature agreeable to him, while it may be torture to a delicate child required to keep still. Moreover, the teacher has his "daily walk and conversation" in a warmer zone than the chilly floor-level usually found in ill-ventilated houses in which the cold air on the floor is not swept away by ventilators opening at the floor-level.

Dr. Robert Angus Smith says: "Warmth must be obtained as the first demand of nature, and without it civilization will go back. When men are cold they give themselves to physical

exercise, and if that is impossible, to discomfort, in which the mind refuses to do more than to complain, if it cannot forget." A teacher would probably regard it as a glaring innovation for his pupils to insist on taking enough physical exercise in a cold school-room to keep themselves warm, but the alternative in such a room is either active exercise or mental torpor in which "the mind refuses to do more than to complain."

For children, the feeble, and the physically inactive, a certain temperature is demanded in the living-room both for comfort and safety. "To those who for any reason are incapable of withstanding and resisting its effects, cold is the great enemy of animal life, and the chief remote cause of human mortality: the effect of cold is most marked when the body is motionless."[1]

The young have less capacity to resist cold than adults for two reasons: 1st, a small body has relatively a larger cooling surface than a larger body; and 2d, they have less power of resistance. These facts point to a higher temperature necessary in school-rooms than is required for adults in home life.

Some persons seem to look down upon bodily sensations as weaknesses, to be disregarded by superior minds, rather than counsels to be heeded; and to consider bodily comfort as having no intimate connection with health. But the sense of feeling was given us as the vidette of danger; it may have a look of bravery to disregard the signal shot of our vidette, but no good general will call it prudent. To live in continual discomfort is to be constantly exposed to disease.

THE HARDENING PROCESS.

Many persons think that one important part of the physical training of the young and the feeble is to *harden* them by exposure, so that they may endure heat and cold, storm and wind, without flinching, thus to produce a hardy vigor which shall ensure robust manhood and long life. They point with admiration to the sturdy forms and ruddy cheeks of the children of the poor, produced by enforced exposure in the open air, but speak pityingly of the pale cheeks and delicate forms of the children of the rich. But return in ten years and ask for those red cheeks, and you will probably find that one-half have paled in death from some acute disease, while the less vigorous but

[1] Marshall's Physiology, p. 877.

better guarded children of the rich mostly survive. The doctrine of "the survival of the fittest," as applied to the young of our species, breaks down in ignominious failure if we consider this red-cheeked robustness the type of "the fittest." Excess of vigor usually ends in premature death. The Wingates, Heenans, and Morriseys die near the normal of noon of life, while the man of delicate frame often lives to his appointed three-score and ten. Call to mind the young men of your acquaintance who, at twenty, excelled in hardy vigor and were the athletes of their neighborhood, how many have passed into sound and vigorous old age? Perhaps the explanation may be offered that these persons trusted too implicitly to their stock of good health, and did not take prudent care to preserve it. But the fact remains that excessive good health differs but little from disease, and especially that form of superlative health secured by the training and hardening process. You may harden steel till it is nearly as hard as the diamond, but its natural elasticity is gone, and it is as brittle as glass.

Do not suppose that I undervalue vigorous health. Good health is the greatest physical blessing, and without it all other forms of physical good become useless toys. But this rude and boisterous vigor, which is often accepted as the highest type of health, is far from being its best exponent. In their extreme forms, *coddling* and *hardening* are alike to be avoided. In health, as in other things, the old maxim holds good, *in medio tutissimus ibis.*

LIVING BY THE THERMOMETER.

Sometimes a person will distrust his natural sensations, in respect to heat and cold, as untrustworthy guides, and betake himself to the thermometer as the only trustworthy indicator for temperature in living rooms. Some years ago I saw an article in the newspapers, in which an invalid, with weak lungs and a constitutional tendency to pulmonary disease, described his mode of life and effort to regain health in about the following words: "*I live by the thermometer*, not trusting my own feelings and sensations in a matter of so great importance. I keep my room, as nearly as possible, at the exact temperature of 60° Fahr., because this is the temperature for living rooms recommended by the best writers on hygiene. I exercise by walking in my room a good deal, and sometimes play the piano vigor-

ously for more exercise. I take my meals at stated hours, avoiding all rich and stimulating food, and harden myself by a daily cold bath. Yet I am chilly most of the time, my health does not improve, I seem to grow a little weaker daily, and my lungs appear to grow worse rather than better. What shall I do more than I have done to regain my health?" Poor man! You are daily freezing to death, yet putting out the fire all the time. Get away from this chilling influence, if you have to break every thermometer in your neighborhood!

WHAT IS THE BEST TEMPERATURE FOR LIVING-ROOMS?

When we consult writers on hygiene, we find considerable diversity in the ideal temperature for living-rooms. As a rule, Europeans seem to be satisfied with a lower temperature than Americans.

De Chaumont says: "As a general principle the temperature of houses is kept too high. For a sitting-room under ordinary circumstances, a uniform temperature of 59° to 61° Fahr. (15° to 16° C.) is sufficient. In a work-room a lower temperature than 60° Fahr. is often desirable, and this applies both to manual labor and to head work." No one will dispute the statement that a temperature below 60° Fahr. is well suited to manual labor, but I seriously question his position in regard to the desirability of a lower temperature for head-work. Mere intellectual activity or brain-work produces but very little heat, and in a cold room the extremities of a sedentary person tend to become cold from deficient circulation of the blood, while the head and thoracic viscera become congested. I now speak of the brain worker as one who sits still for hours together without muscular exercise of any kind.

For school-rooms, Morin places the maximum temperature at 59° Fah.; Ficker, at 64° F., and Varrentrapp at 65¾° F. D. F. Lincoln, in an article on School Hygiene in Buck's Hygiene and Public Health, says: "School children can, beyond a doubt, be made comfortable at 66° F. (and even much lower, if accustomed to it), in a well-aired room." Here we find a difference of 7° between Morin's "maximum" and Lincoln's "comfortable."

TEMPERATURE OF SCHOOL-ROOMS IN MICHIGAN.

Seven years ago I made an investigation into the physical condition of many of the school-rooms in this State, giving special attention to the state of the school-room when filled with scholars. Among other observations, I noted the temperature of the air of the room, both at the level of the desk, and at the floor level. In this way, I carefully examined forty-one different school-rooms during the session of the school. The average temperature of these forty-one school-rooms, at the desk level, was 66°.92 Fah.; at the floor level, 61°.8. The range of temperature in the rooms at the desk level was 63° to 73° F; at the floor level 42° to 71°, omitting one exceptional case, where the floor was heated to 77°, on account of being over the top of the furnace.

Here we find an average difference of $5\frac{1}{8}$th degrees in the temperature at the level of the chest and of the feet, in a child sitting in our school-rooms. If we compare the temperature at the floor, and six feet above the floor, where the room thermometer is usually hung, we shall find a still larger difference where good ventilation is wanting, and the lake of cold air on the floor is left undisturbed.

In the temperature for living-rooms given by DeChaumont and Morin, we are not told at what height the temperature of the room should be taken. This becomes a matter of importance, when we consider that the difference in temperature between the top and bottom of a room is often 15° to 20° Fah. If the temperature is to be taken six feet from the floor, in unventilated rooms, their 59° to 61°, at six feet from the floor, may easily become 51° to 53° at the floor. No child, with the usual amount of clothing, could sit still in air at such temperature for any length of time, without such discomfort as would prevent all desirable mental activity; if active at all, it must be in the line of mischief.

SHALL WE WARM BY RADIATION? OR BY CONVECTION?

In this criticism of the temperature of living-rooms, recommended by DeChaumont and Morin, I have assumed that the method of heating is the same as that used in this State, and that the physical condition of the room, in all other respects, is the same as ours. But if their method of heating differs essentially from ours, such criticism may be manifestly unjust.

The cost of fuel is greater in Europe than in America, which may explain, in part, the lower temperature to which Europeans accustom themselves. They find it cheaper to save animal heat by an increased amount of clothing, rather than use fuel to heat their rooms to a comfortable temperature. An artist, for example, will wear thick woollen clothes, thrust his feet into fur muffs, use a small brazier of coals to warm his fingers when they become too numb to hold his brush, and will thus work all day in some cathedral or picture-gallery, whose temperature would be torture to an American, if deprived of active exercise. But I question whether this saving of animal heat by excessive clothing, with a low temperature in the room, is conducive to better health. It is too much like keeping our rooms warm by shutting off all ventilation—for excessive clothing diminishes *personal ventilation*—retaining the cutaneous excretions, which demand removal as imperatively as the pulmonary excretions. A certain amount of clothing to guard the body against sudden changes of temperature, is the demand alike of decency and comfort; but to secure animal heat by smothering the body with clothing, is a questionable economy.

The difference in temperature of air in living-rooms in Europe and in America, may also in part be explained by the difference in method of heating; in Europe they aim to *warm the person without heating the air* to any great degree; in this country, we *warm the person by heating the air surrounding him.* In Europe they use *radiant* heat; in America we use what I shall call *convectent* heat; that is, heat supplied to the person by convection, or air warmed by movement over some highly heated body. If the person is warmed by the air surrounding him, then the temperature of such air must manifestly more nearly approximate blood-heat than when the person is warmed by radiant heat without warming the air. Like light, radiant heat passes in straight lines from any heated surface, and may pass through a transparent medium without heating in the least, and *it exhibits the properties of heat only when it is absorbed and retained by some body which will not transmit it.*

I was walking along the streets of Lansing last summer, when a merchant, who was sunning himself before his door, hailed me: "Doctor, from what source do we derive our heat?" "Ultimately from the sun." "Then what warms me now is heat from the sun?" "Certainly." "How can that be when

the heat coming from the sun must pass for millions of miles through space colder than anything we ever find on the earth? Why is not the sun's heat used up in warming space and lost long before it reaches the earth?" "Because space is transparent to heat, arrests none of the heat rays any more than it does the rays of light, and it is *only when radiant heat is arrested* that it becomes that form of heat which is capable of manifesting changes of temperature. The sun's rays, containing light and heat associated together, may fall upon a block of clear ice and pass through it without heating it a particle; cut that block into the form of a large convex lens, to bring the rays to a focus, and you can ignite wood or melt gold with the radiant heat which has passed through ice without heating it enough to melt a drop. This is because clear ice is transparent to solar heat; but if charcoal dust is scattered through the ice, it will arrest the heat rays and the ice will melt around such opaque particles."

We see the same principle at work in a variety of ways. I have often seen snow melting on the side of a stump exposed to the direct rays of the sun while the temperature of the air was but little above zero F. On a sunny June morning, when the temperature of the air is 60° F., you feel warm and comfortable in the sunshine because you are warmed by the sunshine rather than by the air; sit down in the shade for an hour and you will "catch cold." Part of the invigorating influence of a bright spring morning, and one reason why it is a joy to be in the sunshine, is that we are warmed by radiant heat while we are in a cool atmosphere. We are warmed and invigorated instead of being heated and debilitated. Every thorough scholar must have noticed how much more energetically the mind works in a cool atmosphere, provided the body is comfortably warm, and how sluggishly the mental operations go on during hot and sultry weather. But to secure bodily warmth in cool air we want radiant heat. To live radiant lives we require radiant heat.

HEATING BY RADIATION.

In Europe house-warming is mainly by radiant heat. In Great Britain the open grate, with its glowing fire of coals or peat, warms and irradiates the British house. In Germany and France the porcelain stove warms mostly by radiation of non-

luminous heat, but in part also by convection. The radiant heat that *warms the person upon which it falls instead of the air through which it passes* will not require so high a temperature of the air in order to maintain bodily comfort as will that mode of heating where the air itself is the chief heating material.

HEATING BY CONVECTION.

In this country we once had the blazing open fire, but this has given place to "that sullen gnome, the air-tight stove," and this is fast giving place to hot-air furnaces or coils of steam-pipe. To a large extent we have banished radiant heat from our houses, and depend almost entirely upon convectent heat. Even when we retain the stove which radiates some heat the air of the room is warmed mostly by convection; in hot-air furnaces of every kind the warming is entirely by convection. It is obvious that if we heat a person by hot air we must have such air hotter than when we send the heat through the air by radiation from some highly heated surface. Convectent heat requires a hotter atmosphere than radiant heat. The radiation from steam coils is deficient in penetrating quality as compared with radiation from highly heated, and especially from luminous bodies. It is correspondingly feeble in its influence on animal temperature. If our rooms are warmed by the method of convection of heat by means of hot-air furnaces of any kind, or even by radiation from surfaces of low intensity, such as ordinary steam coils, I think the air must be heated some ten degrees hotter than when we are warmed by radiant luminant heat. I confess that I cannot sit in comfort in a furnace-heated room when the usual room thermometer marks less than 70° F.

HEATING BY CONVECTION REQUIRES VENTILATION AT THE FLOOR-LEVEL.

One necessary condition of properly warming a room by convection is too often neglected, namely, that the whole body of air in the room must be in motion in order to warm the air at the floor-level. The primary currents in convection of heat are all upward; the hot air pouring into a room from the furnace through a register in the floor, passes directly to the top of the room. If the ventilator is near the top of the room this hot air may escape by it, having traversed the room without any marked

influence on the temperature of the lower stratum of air. The hot air at the top of the room cannot warm the lower portion of the room, except by replacing the cold air below. No amount of heat at the top will be conducted to the bottom, because air is almost an absolute non-conductor of heat. A test-tube filled with ice-cold water and a bit of ice frozen in the bottom may be boiled at the top without melting the ice at the bottom. The boiling water is lighter than ice-water, and will not descend to take its place. The same is true of air. To demonstrate this I took a combination tube of nearly infusible glass, twenty-four inches long and one-half inch internal diameter; the tube was closed at bottom to prevent currents of air, a thermometer was placed in the tube, the tube placed in a nearly vertical position, and a strong gas flame applied to the tube six inches from the upper end and eighteen inches from the bulb of the thermometer. The thermometer so nearly filled the tube that the bulb of the thermometer was nearly screened from radiant heat of the gas flame, and could only be warmed by heat conducted to it by the glass tube or by the air contained in it. The upper part of the tube was heated to the melting point of zinc (773° F.), and this temperature maintained for an hour, yet the thermometer indicated an increase of temperature of less than one-half a degree. Here I had a room with only eighteen inches between floor and ceiling, and a difference of temperature of more than 700° F., yet the floor is warmed in one hour less than half a degree. I then ventilated this room by opening the bottom of the tube, and rapidly withdrawing the air from the floor-level by an aspirator, when the thermometer in one minute rose 275° F. (from 65° F. to 340° F.). These experiments give some idea of the difficulty of warming the bottom of a room by convection of heat, unless there is good ventilation from the floor-level.

Radiant heat is not influenced by gravity, and may penetrate and warm the bottom as well as the top. In nature we find the hot air at the bottom of the atmosphere and colder air as we ascend, because the earth is warmed by radiant heat, and the air is mainly warmed by contact with the earth.

COMBINATIONS OF CONVECTION AND RADIATION.

Every person will concede the superiority of heating by radiation over that by convection; also that the open fire secures ventilation; but they object that it is a wasteful way of house-

warming, because so much heat escapes up the chimney and is not utilized in warming the house. If convective heat is used to warm the house up to a certain temperature, and the living-room filled with light and warmth by an open fire, a very satisfactory condition of the temperature in living-rooms will be secured without a large increase in cost.

LUMINANT HEAT.

We have almost banished luminant heat from our houses. The light of our fires is hidden under a bushel-like stove, or buried in some secret furnace pit in the cellar, and not placed in the Scriptural position where "they which come in may see the light." We need to study nature's plan of warming, which is by *associated light and heat.* We do not often get the start of nature in our methods, and when we do we usually find ourselves going in the wrong direction. "Walk in the light" is sound theology and good hygiene. We do not secure in our living-rooms enough of this association of heat and light which we find in nature's plan as seen in the solar ray. The marriage of heat and light gives health as their offspring. What God hath joined together in nature's plan let not man put asunder in warming his home.

THE PERSONAL FACTOR IN THE ETIOLOGY OF PREVENTABLE DISEASE.

By ALFRED LUDLOW CARROLL, M.D.,
NEW YORK.

It is a mere truism to state that preventive medicine is necessarily dependent upon our knowledge of the etiology of disease, and that its improvement as a practical art must advance *pari passu* with the increasing accuracy of such knowledge. Unfortunately, notwithstanding the excellent detective work which has been done with regard to general insanitary conditions, we are still in almost complete ignorance of the special origin of any of the morbid phenomena with which sanitary science has to deal.

In all preventable maladies, at least two factors are to be considered: the exciting—it may be specific—cause, and the susceptibility of the individual. Of the latter, particularly in relation to disorders of the zymotic class, but little note is taken or information possessed.

Some specific contagia, such as smallpox, measles, etc., "breed true;" although even here we find some persons resisting and others succumbing to the same exposure. In these, moreover, there enters, apparently, a third factor, formerly spoken of as an "epidemic constitution of the atmosphere," increasing individual receptivity of contagion, and turning the scale between sporadic and epidemic prevalence. I am aware that many epidemiologists explain the recurrent waves of contagious zymoses by the hypothesis that, one epidemic having exhausted the susceptible material in a community, a fresh generation of unprotected persons must arise before the same disease can again commit general ravage. But the frequent occurrence of sporadic cases in the intervals, serving as possible foci of infection and yet with little tendency to extension, and the fact that during epidemic years second attacks of the same malady are oftener

reported, seem to indicate the operation of some occult predisposing influence. The advent of cholera is commonly heralded by a proclivity to simple diarrhœal disturbances; in scarlatinal outbreaks non-specific angina is unusually apt to effect even protected persons; an increased liability to catarrhal troubles seems to attend an epidemic of measles; *et sic de similibus.*

In other cases, however, specific variations in the manifestations of a common morbific agent appear to be determined by the peculiar proclivities of different patients; *e.g.*, from "sewer gases" or contaminated drinking water may arise diarrhœa, septic dysentery or typhoid, quinsy or diphtheria, erysipelas, the "patchy" form of pleuro-pneumonia, etc., according as the patient's throat, respiratory or digestive organs may be most susceptible.

I know that I am at variance from some of my hearers in assuming the pythogenic origin of several of the disorders which I have named; but a tolerably wide experience for some years past in sparsely settled rural districts, where individual circumstances can be more readily ascertained, and accidents of importation of contagia more rigorously excluded, has afforded me repeated and convincing evidence of the origination of both typhoid and diphtheria from excremental pollution of either water or air. There is a constantly growing belief that even scarlatina may be generated *de novo* by filth poisoning under certain somatic conditions of which we are as yet ignorant. We know that diphtheria prevails most during childhood, when the tonsils and larynx are the most vulnerable points, and that a marked proclivity to it is shown in particular families with hereditary tendencies to other forms of sore throat. The same observation applies to other inherited or acquired susceptibilities to peculiar forms of disease.

Even under the "germ theory," this view of a personal factor as modifying the specific development of an implanted microphyte is tenable, since it is almost certain that various forms of fungous vegetation (as in the case of apparent species of puccinia, uredo, etc.) arise, not from any specific difference in the original germs, but from "the modifying influence of the circumstances under which they are developed;[1] and it is easier to imagine that the universally present germs of bacteria, etc., are influ-

[1] Carpenter on the Microscope.

enced in their mode of growth by the pabulum which they find in different unhealthy conditions of the animal system, than to believe that there are separate specific bacterial germs of typhoid, diphtherial, pyæmic, or other character, always lurking in ambush for possible victims.

The "alternation of generation," so to call it, of pathogenetic virus is farther exemplified in the puerperal state, where the pelvic receptivity stamps a peculiar type of infection upon contagia arising from erysipelas, scarlatina, or ordinary sepsis.

The brief time at our disposal precludes elaboration of the argument; but, out of many illustrative examples in my note-books, I may be permitted to cite two or three of the more striking ones:—

I. A cottage situated on the shore of the Kill von Kull, in an aristocratic neighborhood, having its private drain emptying into the river. Drain obstructed and escape of sewer gas into house. Repeated attacks of diarrhœal troubles at first; after two or three months a severe case of erysipelas in one member of the household; another lapse of a few weeks and two inmates were almost simultaneously seized with quinsy. Summer, with its open window ventilation, passed without serious illness; but early in the ensuing autumn a case of enteric fever was developed under circumstances which excluded the possibility of an imported contagion. Finally, a few months afterwards, a second and fatal attack of erysipelas fell upon the same patient who had previously suffered from it. These cases occurred in a family comprising five adults. Another tenant, with two young children, shortly afterward moved into the house, and very soon the children (up to that time in robust health) were on my hands, at one time with diarrhœa, at another with obscure febrile symptoms, again with tonsillitis, until, as the landlord failed to make the necessary repairs, I advised removal to other quarters, with the result of a rapid restoration to perfect health.

II. A house on an unsewered avenue in New Brighton; unventilated cesspool; water-closet in a windowless sort of pantry between bedrooms on second floor; insufficient flushing-water and unventilated soil-pipe. Family, including servants, four adults and one delicate child. First, minor diarrhœal disturbances and general malaise; then scarlatina in the child, who had neither been away from the place nor received suspicious visitors. (All my efforts were fruitless to trace contagion through

milk-supply, laundry-work, or tradesmen of various sorts, nor could I learn of another case of scarlatina within a radius of a mile. I give the instance, however, for what it is worth, without wishing to dogmatize as to its origin.) At last, nearly a year afterward, diphtheria showed itself in three members of the household, its first victim being the child, who died with evidences of the most overwhelming blood-poisoning.

III. One of the handsomest and most expensively kept places on Staten Island; no public sewer in the neighborhood; several water-closets in the house, emptying into cesspools; house old enough for soil-pipes to have passed their prime. Sequence of pathological events: After several diarrhœal and dyspeptic manifestations, a pronounced and fatal attack of typhoid in one of the maids; soil-pipe in servants' water-closet (second floor) found corroded and permitting the egress of sewer-gas from numerous openings.[1] The next winter developed erysipelas in one of the down-stairs servants; a drain-pipe broken in and sewage oozing into the cellar. Repairs were made, and for about two years no grave maladies occurred, until, on the return of the family from a trip to Europe, diphtheria in a severe form attacked nearly the entire household, then under the care of my friend, Dr. W. C. Walser. On this occasion I am informed that another house drain had given way, so that its contents leaked into the cistern from which drinking-water was drawn.

In all these instances, and in many others which I could cite, a common exciting cause seems to produce different disorders, not only in different persons, but in the same person under different intrinsic conditions; in other words, the disease appears as a *tertium quid* resulting from the union of the external and the personal factors. Of the intimate nature of such varying idiosyncratic vulnerability we as yet know little or nothing; but it is an element of prime importance in the study of preventive medicine, and deserves the closest investigations of sanitarians.

[1] This case was more fully reported in the London Practitioner, May, 1875.

MICROSCOPICAL SECTIONS FROM CASES OF DISEASE OF THE BRAIN AND SPINAL CORD.

By CHARLES K. MILLS, M.D.,
Neurologist to the Philadelphia Hospital,

AND

CARL SEILER, M.D.,
Pathologist to the Presbyterian Hospital of Philadelphia.

THE sections exhibited, forty-six in number, were nearly all of large size, and were prepared from specimens from the following cases:—

1. A case of hydrocephalus.
2. A case of posterior spinal sclerosis terminating in general paralysis of the insane.
3. Two cases of epilepsy.
4. A case with hydrophobic symptoms.

In the case of hydrocephalus, the sections were from the pons Varolii, cerebellum, and various regions of the cerebrum. Some were of very large size. One, for instance, comprised caudate nucleus, internal capsule, lenticular nucleus, external capsule, claustrum, and island of Reil. In the case of posterior spinal sclerosis terminating in general paralysis of the insane, the sections exhibited were from twenty different regions of the cerebro-spinal axis, from the lower lumbar portion of the cord to the convolutions of the præ-frontal lobes of the brain. They seemed to show an ascending progression of the sclerosis; while, at the same time, certain encephalic areas had evidently been attacked independently of a continuous process. One of the sections from the cases of epilepsy was of the entire length of the pons and medulla oblongata. The sections from the other epileptic case, and from the hydrophobic case, were those exhibited by Drs. Collins, Mills, and Seiler to the Philadelphia County Medical Society, May 25, 1880.[1]

[1] A paper on these cases and specimens has since appeared in the Philadelphia Medical Times for July 31, 1880.

MORAL TREATMENT OF THE INSANE.

By CHARLES W. PAGE, M.D.,
CONNECTICUT.

There is no secret process employed in asylums by which the insane are restored to self-control and reason. Drugs are prescribed for most cases, but great reliance is placed upon moral influence, "the contact and authority of sane over insane minds, supplying control from without, which the patient cannot exercise from within, and by employing all the means which operate on the feelings and habits of the patient."

By close observation and study, the physician who correctly reads human nature will employ devices and expedients towards this end, the variety of which is simply endless when a number of cases are considered. In short, the successful practice of this part of the specialty is an art, the mastery of which requires special aptitude and study.

Integrity and positive convictions on the part of officials are fundamental principles.

An attitude of mild yet unvarying command must be maintained, while diligent efforts are made to merit confidence and correct false impressions.

In addition to his personal attention, the physician who assumes such trust is responsible for neglect to employ those accessories which art and practice have demonstrated as valuable agents in the treatment of insanity. Suitable assistants and nurses must be secured and cultivated, as the degree of approach to a healthy natural life which the patients enjoy depends largely upon the character of these attendants, their faithfulness in executing orders, with their willingness and tact to further at all times the purposes of the physician.

The order and system required in asylums generate a certain air of discipline which is one of the most powerful moral influences to which patients can be subjected, though constant care must be exercised respecting classification, as a favorable associ-

ation may from a slight accident become prejudicial, while by a judicious grouping benefits may accrue to each by comparison, arguments, and mutual reactions on one another.

There is a limit probably in congregating the insane beyond which benefit cannot be expected; but solitude is certainly unfortunate, and associate day rooms, dining-rooms, and dormitories have advantages aside from economic considerations.

To persons enjoying perfect health and freedom monotony would be enervating; and it becomes deplorably so, in its effects, when enforced upon the patients in our large asylums, and efforts have always been made to provide diversion and amusement for such communities.

Daily walking or riding affords one of the most available means. The popular indoor and field games are usually supplied, and asylums are considered incomplete without an amusement room, where large numbers can gather for readings, lectures, concerts, magic lantern, or dramatic exhibitions and dancing. Where, too, in some asylums, under a competent instructor, light gymnastic exercises are participated in daily by the patients; while for the gentlemen, out-of-door military drill is adopted as a regular feature of the daily duties at a limited number of institutions. These last two methods of exercise and discipline cannot be too highly commended; when accompanied with music they, perhaps, rank nearer perfection than any other form of amusement. To perform the various movements in concert and at command can but serve an excellent purpose—corrective and curative—mentally as well as physically.

Instrumental music and singing are remarkably effective and should be liberally patronized in all institutions, and as it affords great comfort to many, all should be permitted to assemble daily for Divine worship.

Amusements, however valuable, are but occasional at best, and in no sense supply the necessity for regular legitimate occupation.

The introduction of educational appliances into insane asylums would furnish the physician with improved machinery for moral treatment, and justly discharge a responsibility which the public assumes when it deprives of free action innocent persons endowed with intelligence.

How can mental application and discipline be better promoted than by a system of study and instruction?

It would fulfil a requirement beyond the scope of amusements.

For instance, select a patient plunged into the deepest melancholy—to the verge of suicide,—it may be by some rèal affliction,—will amusements divert and tickle a mind thus preoccupied? Yet the attention of such patients can be engaged in serious matters, and desperate cases have been cured by a course of thorough study.

Who doubts that by such an agency the weary mind can be relieved, gaining at the same time general vigor, power of self-control, and buoyancy of spirits?

Certainly it would materially assist in the restoration of many and greatly benefit the less fortunate class, and in estimating the success of insane asylums, the world of misery alleviated should be considered quite as much as the number of recoveries reported.

There have been occasional attempts to educate patients in some American and other asylums, but the Richmond District Lunatic Asylum (Belfast, Ireland) is the only one which serves as a model in this respect. Schools of instruction have been in operation there for twenty-five years, and the thorough system developed, and still pursued, is heartily approved by all, including eminent authorities, who have made a personal examination.

For simplicity and efficacy, however, another greatly neglected form of moral treatment easily ranks first; especially as regards the chronic division, manual labor is the major remedy.

Good health demands bodily exercise; the sum total of nervous invalidism which the no-vocation class suffer is immense, and admits no other conclusion. And in some diseases which exhibit disordered operations of the mind, constant and systematic work has superior claims as a remedial measure. For its quieting and hypnotic effects in cases of excitement it is superior to drugs in many respects.

For the purpose of breaking up the custom so common among the insane of self-centreing the attention, and for interrupting habits of pre-occupation of the mind, nursing delusions, or deploring stupid and fictitious possibilities, constant employment is indispensable; for scarcely in other ways can many such cases be reached.

But by methodical, active exercise the mind is relieved of

oppressive and debilitating strain, while tone and vigor are imparted to the physical system, upon the healthy condition of which mental soundness depends.

With this object in view, the superiority of work as compared with amusements is pronounced—amusements are spasmodic while labor is systematic and continual. Many methods of amusement lead to violent exertion and risk; but labor can be ever mild and safe, and while devotion to amusements always tends to a state of dissipation, "labor affords invigorating mental nourishment."

As a prophylactic against insanity it has large application, as a curative agent it is exceedingly important, and nothing can be substituted in promoting the well-being of the chronic class. To preserve health, to provide a safety valve for surplus energy, to obviate the necessity for mechanical restraint, and to counteract the corrupting tendencies in a large mass of irresponsible human beings, some degree of toil is imperative and pre-eminently humane.

If it is ever true that an idle brain is the devil's workshop, it is true of the idle brains found in an insane asylum; and the most effective, if not the only way, to induce legitimate operations in some brains is through the hands—by manual labor.

In all asylums there will be many incapacitated for labor, and discretion must be exercised in this regard, but when it is not contra-indicated the physician ought to insist on its enforcement.

A varying amount of labor, voluntary for the most part, is already performed by patients in the wards, kitchen, laundry, garden, etc., but it can scarcely be claimed that in any American asylum there is constant employment for all who could work.

Where it is the rule to work nearly all will comply with the requirement, and but few resist the moral influence of example. An obstinate case should go with the workers and become an idle looker-on, if not an active participant, and "he who, having been accustomed to labor, can stand daily and observe others at work without voluntarily taking part himself, is a remarkable man" (Dr. Rutherford).

Rewards, privileges, or better still, a percentage of earnings, may be offered as an inducement; but in some manner, at the discretion of the medical superintendent, all the able-bodied

inmates of our charitable institutions should be prevailed upon to work.

The authority of the physician is upheld in other respects—seclusion, restraint, administering food and medicine by forcible means if necessary—and is it not as wise and as humane to require a reasonable wholesome amount of work from, at least, indigent patients?

For fifty years our best authorities and most successful specialists have plainly and decidedly advocated such measures. Said one (Dr. Pliny Earl) on an important occasion: "The agency of manual labor is universally eulogized as among the most potent of hygienic and curative means; why, then, is it not prescribed and administered?" The chief reason for the limited application of this policy in American asylums probably is its financial failure, but that explanation is fallacious, for the full value of labor for the insane is to be estimated by a higher standard than money.

One of many beneficial effects arising from employment is a diminished necessity for mechanical restraint. While more or less restraint must be imposed upon the insane, the general use of mechanical apparatus for that purpose is everywhere deprecated. All admit that for some cases it would meet the necessity better than anything else, but fearing that abuses would creep in if allowed in exceptional cases even, a very respectable class of specialists demand the total abolishment of all mechanical appliances in restraining the insane.

Such has been the attitude of the British Association, and strenuous efforts have been made to hold individual members to that standard; but while they have never been entirely agreed in the sentiment, of late a tendency towards moderate views has been exhibited, and a disposition manifested to tolerate in others what they insist upon for themselves—freedom of opinion and action.

Their best authorities countenance its use in some instances, and many of their prominent medical superintendents assert their independence on the subject.

In his last report, the superintendent of the widely known and greatly admired West Riding Asylum, regrets that mechanical restraint had been neglected in caring for a case reported, and gives notice of his intention to use it in future like circumstances.

The stand taken by American superintendents on this subject has been the occasion of severe criticism.

They do not deny that under favorable circumstances mechanical restraint, in the English acceptation of the term, can be dispensed with; but as its use at times seems necessary in asylums constructed as ours are, they see no reason for rejecting a valuable agent because it has not the unanimous sanction of the specialty when "ninety per cent. of the physicians engaged in lunacy practice throughout the world advocate a limited use of mechanical restraint."[1] In keeping, then, with nine-tenths of those practically acquainted with the subject, they agree that it may be used if restricted to narrow limits, and no doubt endeavor to confirm their practice to their professions. But have all resources been exhausted in attaining the minimum point?

There is no doubt that constant employment would obviate much of the demand for restraint. Is it not then the plain duty of asylum managers to provide the necessary means for systematic occupation?

A more thorough system of oversight and supervision would also contribute largely to the same ends.

There is no restraining power on earth like human vision as it affects the sane or the insane, and certainly the insane should have the benefit of whatever assists them in self-control.

Many of this class can be trusted, and should have special privileges, and the benefit of parole, but the majority are vastly better to be constantly under the eye of an official. The moral influence of perfect oversight would rapidly counteract the tendencies of those enslaved to vice, or bent on mischief, as well as those contemplating escape or suicide. But that is not a perfect system of oversight, which while it may insure continuous watching during the day, expects next to none at night, when the symptoms of insanity are often aggravated, and the only remedy consists in largely multiplying night nurses in connection with a more general use of associate dormitories in asylums for the insane.

Of the suicidal and other cases, which in the prevailing arrangement require special means for security during the night, probably the necessity for mechanical restraint in one-half the cases could be done away with, at a stroke, by adopting such a system.

[1] American Journal of Insanity, vol. xxxv. p. 305.

Besides, there are other good reasons why associate dormitories should be adopted. The common dread of being locked in a dark room, at night, alone, with some, amounts to genuine terror. Then in the event of a fire—and the list of modern holocausts includes a number of insane asylums—how fortunate if the patients are not locked in single rooms, and how much better for the patients to sleep in a large, dimly lighted room, over which a quiet nurse is stationed as sentry, than to have a watch tramp through the echoing halls, opening and closing doors, handling grating keys, and flashing a light into patients' rooms and faces—preventing or disturbing sleep—and all this, at best, for the sake of having a glimpse of the patient once an hour.

Then, too, the load of anxiety which the superintendent must carry would be happily lightened by this method of care; with what relief could he retire each night, confident that his responsible charge would be under the vigilant eyes of trusty nurses until his morning visit.

How many accidents in asylums would have been prevented, if, by shrewd anticipation, a nurse had been present at the right time. There is safety only in continual watching.

In order to secure for patients the best service from attendants, some modification of the usual system seems desirable. Generally each person employed in such capacity has charge of, and authority over, certain patients, at the same time performing all the menial duties incident to a large establishment.

They must be proficient housekeepers and chambermaids, who should be the intelligent, self-respecting aids of the physician. You may dub them attendants, but unofficial eyes will look upon them as servants or keepers depending upon the standpoint of observation.

A suitable companion for a nervous invalid, often made doubly sensitive by the nature of the malady, cannot properly be associated with the drudgery of the kitchen and house cleaning. Yet it is extremely difficult for the ordinary attendant to understand that qualifications for the position he holds should be determined by a higher standard.

There should be different orders of employés in such asylums—varying in rank and duties with corresponding responsibility. Ordinary servants could do many things now required of attendants.

The infirmary and acute wards must be in charge of experienced nurses; but a long-felt necessity exists for a special night service to relieve day nurses and to watch over associate dormitories.

There is a demand for practical mechanics to instruct in the trades and oversee working patients. And every asylum should have a corps of well-informed teachers, to conduct educational, dramatic, and social exercises, and to preside in the dining-room and chapel.

Instead of engaging by the year for general utility, the service and hours of duty expected of each person should have some limit and be clearly defined in advance, for how else can proficiency be expected; and to secure persons of mature judgment, who would take intelligent pride in their occupation, increased salaries must be offered, with better opportunities for satisfactory social life.

If, then, the best interests of all concerned require important changes in the method of watching, nursing, instructing, and employing the insane, an obstacle to their adoption is at once discovered in the interior construction of American insane asylums. But this difficulty could be easily remedied, especially in building new asylums. Besides the cost would in this way be materially reduced, for many expensive features in the present standard insane hospital could be omitted without diminishing the comfort of the patients or sacrificing one chance of effecting recoveries.

There is abundant evidence of the drift of public opinion on this subject. The demand for retrenchment has become emphatic, and many well-qualified observers are convinced that the best interests of the insane lie in a parallel direction.

The advantages of small hospitals, where acute and chronic cases could be treated together, have always been insisted upon by the best authorities, but confronted by the fact of unexpected and increasing numbers to be cared for, it seems necessary to surrender in some degree the ideal to the practical, and to establish small hospitals for the recent and curable cases, and separate large asylums for the chronic insane—the one a hospital, devoted to treatment and cure, the other an asylum, given up to the management and care of those who are past recovery but cannot care for themselves.

These special hospitals may be attached more or less intimately

to general hospitals, at least in large cities where medical schools are established, thus affording opportunity for clinical instruction and study; but an accessible country site is the appropriate place for an asylum, and then, when more than two hundred are to be provided for, a group of separate blocks, arranged for convenience and symmetry, should replace the omnibus model of a single huge building.

Genuine cottages connected with some institutions may answer a good purpose in the treatment of a few patients of the private class, but it is not plain how the interests of the larger number can be advanced by dispersing them into small, detached so-called cottages. In what respect the life of a few patients thus isolated can resemble healthy, natural, family life, it is hard to imagine.

Sane men naturally avoid solitude and desire association. The mass of the population flock to the great centres, when, if such congregate life is properly regulated, no doubt it is the most enjoyable and the most fruitful of good results.

Again, the plan to distribute the chronic insane about the country in families would, on the whole, initiate a backward movement towards the condition of the insane before the establishment of asylums; and the history of this subject shows conclusively that when physicians began to interest themselves in insanity and to collect the insane for care, study, and treatment, their sad condition began to improve. Then, and not till then, began their emancipation from neglect, uncharitableness, superstition, and abuse.

The State, then, cannot properly delegate to any but physicians the chief agency for maintaining this great charity; and the inclination to retain insane wards in almshouses and county receptacles merits continued protest.

That the hospitals must have a physician in charge is too evident for discussion. A superintendent with a medical education is also essential at the head of the asylum, where every patient bears evidence of disease, which, if considered chronic, may become worse at any moment, and where, too, much ordinary sickness will arise.

Again, where, except in the medical profession, can a properly qualified person be found to accept the trust for the modest salary attached? Added to his medical attainments, he should possess the highest moral qualities. "By him every member of

the community over which he presides is affected in spirit and moral tone." He must take a vital interest in the broad field of philanthropy, hold large views and entertain generous sympathies, that while he is absorbed in details and individual application, he is constantly working to a high standard which he can but strive for as he studies and generalizes on the grand problems involved.

INTERVENTION OF THE PHYSICIAN IN EDUCATION.

By R. J. O'SULLIVAN,
NEW YORK.

At a meeting of the Association at Buffalo in 1878, Dr. E. Seguin read a highly interesting and suggestive paper on the intervention of the physician in education.

The following committee was appointed to report on the suggestions of the paper at the meeting of the Association at Atlanta, Georgia: Drs. R. J. O'Sullivan and E. Seguin, of New York, D. B. Lincoln, of Boston, W. H. Van Bibber, of Baltimore, Wm. Clendenning, of Cincinnati. The report was not read at that meeting, but it was ordered that the chairman of the committee report at the meeting in New York. The suggestions of the learned and venerable author of the paper referred to cover very fully the ground he had assumed as to the physician in education. In the rapid action and push of everything pertaining to education in this country, we can hardly expect in the beginning to succeed in carrying out, in its varied details, the minutia of the physical curriculum laid down by the learned gentleman. Yet there are some points in the paper that are eminently practical, which the following extract will show:—

1st. "During vacation the physician in charge must have supervised the school, seen that everything is clean, and uncleanliness almost impossible; that the grounds be drained in the right direction, and shaded on the proper side; that lights be kind to the eye; that the books, charts, images, and the like be duplicated in several types to suit the different conditions of vision; that the desks fit the progressive ages, and the seats the diversity of shape of the children, particularly of the girls, according to the admirable directions and drawings of Liebreich.

2d. "Before entering the school the pupils must be scrupulously examined, and their status minutely recorded, as much

as possible in figures, with the metric system and centigrade thermometers in regard to their general appearance; condition of skin and glands; relations of age to size; relations of size to weight; relations of proportions of parts, or relations of proportions of head to face; relations of proportions of trunk to limbs; conformation and proportions of head; conformation and proportions of mouth; conformation and proportions of ears; conformation and proportions of eyes; conformation and proportions of hands; irregularities of both sides; spinal anomalies (carefully surveyed); breadth and thickness of the chest; circulation; respiration; temperatures, central, local, superficial, possible differences on the two sides. Remarks on the influence which the above conditions must have on the general and special training of the child, what to avoid, and what to look for in the school.

3d. "Before allotting a child to a class-room, and in it to one place in relation to the teacher and teaching apparatus, let us consider and note the reach and degree of precision of his sensory organs, and particularly wherefrom will he see and hear best. Otherwise placed, his senses may grow worse; or the erectile tension of their organs, which causes the attention of the mind, being found useless will slacken, and the desire for learning will die away in proportion to the impairment of the senses as to the conscientiousness of the inutility of further efforts. Many educations have failed for this neglect of the physical conditions of some mode of perceptions. (For the eye let us be guided by the table-tests of accommodation, and for the ear follow those of Sapolini, of Milan.) The defects so stated it is easy to see from time to time if they are growing less or worse. By hygienic cares, and a wise progression of acoustic exercises, the hearing may be improved in the school; but for the eye the school conditions are almost fatally adverse. Since there is an incessant demand for the eye to look, mainly in a maze of speck letters, if the eye was healthy at first, from constant reading it may become sick; and if already sick it will grow worse in a progression which has been calculated, and found commensurate to the duration of the curriculum, and to the intensity of the studies in this wise: 'All myopic eyes are diseased,' says Donders. In the first year of reading 0.4 of the scholars become myopic; in the second, 4.8; in the third, 8.6; in the seventh, 11.3; in the ninth, 24.1; in the eleventh, 49.5; and the proportion increases

also in proportion to the intensity of the studies, according to authorities too competent to be doubted, too numerous to be named! Would not it be humane in teachers to acknowledge their incapacity to deal alone with this problem, and to require instead of shunning a physiological examination which would indicate what types the children must be given to read, and other cares to be taken at school of their sight? Thus only could be stopped the fearful increase of myopism, which seems to tend to make men the rivals of the fishes of the Kentucky Mammoth Cave. Some say it matters little as long as we can only buy spectacles. On this score it would be better yet were we born with this astride ornament. But myopia, and other eye affections of school origin, are more than physical disease and infirmity; they create most regrettable incapacities, as of exercising many select industries and most of the fine arts. They have also a decided influence on the mode of formation of judgment, which in short or otherwise ill-sighted people is biased by the necessity of looking at things, not as they are, but as they are imagined or liked to be. Three remedies or prophylactics can be prescribed by the school physician, with the view, if not to cure myopia, at least to stay its progress. One already hinted at is the use of books and other prints whose types must correspond to the visual accommodation; another, the supply of an abundant and unique light (the one coming from the left being preferable); the third, to transfer most of the studies, exercises, and amusements in the garden-schools, summer-schools, natural history, and drawing excursions, in which the eye is invigorated in distant and placid horizons. An every morning medical survey is expected from the school physician; first, as a quarantine measure against the introduction in the crowd of children contaminated by zymotic or contagious diseases, the suspected ones to be kept under observation in regard to the pathological temperatures, and other signs which precede the specific symptoms by several days; second, as a means of discovering the simulated diseases as well as the dissimulated ones. During the session, and particularly at the change of season and of temperature, it is important to note the effects of the course of studies on the children. Their mind, which was a blank when they entered the class-room, is no sooner set to work at intellectual or mathematical combinations of facts, ideas, or figures, than the rhythm and number of

the pulsations are changed; the heart beats stronger, the blood afflues to the head through the visibly increased calibre of the arteries, the volume of the head is increased too, the general temperature is higher, that of the head considerably so, sometimes that of one side only or of the base, whilst that of the extremities has cooled. Call it, if you please, an intellectual perturbation, but its action on the physique cannot be overlooked, since its frequent recurrence every day threatens danger. In former papers I have quoted the fate of scholars killed by the congestive and combustive process of thinking. Last fall another was added to the fatal list, the worthy grandson of the physiologist Richardson. And this spring offers in holocaust the poet-laureate of Yale College. And I doubt not that our public school has its victims, since I attended quite a number of sick children from overwork."

In the sweltering days of last week, when the thermometer was upwards of ninety degrees, what a relief it would have been for the children in the ground classes of the primary departments of the public schools, with the bad, *very bad*, sanitary surroundings, to have been dismissed immediately after the morning session for the day. The law requires two sessions a day, but there is no reason why the board of education should not dismiss the lower grades immediately after entering the second session, and thus liberate 17,000 of those little ones from constrained position and vitiated air, which would be cruelty to animals to compel them to endure. If we must have school in operation during these sweltering days for the few weeks preceding and succeeding vacation, the excellent suggestion of Dr. Seguin regarding the "garden-schools" would fully meet the indication; but I am afraid that it will be some time before such a radical change will be made in the management of our school affairs.

VACATION.

The work of the physician in education is at all times and seasons required, but especially during vacation can his experience be utilized in various directions indicated in the paper. Instead of attention being given to the required hygienic conditions usually—apart from the annual house-cleaning—our colleges and academies are closed, class-rooms locked up, teachers and janitors having generally a good time, no thought or attention being given to drainage or ventilation. In our public

schools, when the usual repairs are made, calsomining of walls, ceilings, etc., the class-rooms are closed, and all ventilation and light are studiously excluded until school opens. These precautions are taken solely with a view to save trouble for the janitors. The inspection of this work is rapidly done during the first days of the vacation, when it is customary for the ward trustees to inspect the building. I at one time determined to observe this process of inspection, but, unfortunately, I was five minutes late. I ascertained at the time that the school officials merely glanced at the upper rooms, and paid no attention at all to the cellars, closets, or ventilating shafts.

INSPECTION.

The plan recently organized in France would, if adopted here, meet some of the suggestions. The medical inspector visits each school weekly, or semi-weekly, and records in a journal, provided for that purpose, the general condition of the schools, as regards heating, lighting, and ventilation, absence caused by illness, isolation of the sick, etc. The remarks of Dr. Seguin on diseases of the eye in schools, accord with the examination recently made in various cities of this country. The suggestion as to a daily medical survey is a very important one. This is especially so in city schools, where there is a very large attendance, as, for instance, the public schools of this city, where the average daily attendance is over 100,000. For several years the necessity and utility of medical inspection have been advocated. It has received the unanimous indorsement of the medical profession of this city and State. This opinion cannot be better expressed than in the admirable remarks of the President, Dr. Thomas F. Rochester, in his inaugural address before the Medical Society of the State of New York, June 20, 1876. Dr. Rochester said, Education was not in all instances "the unmistakable blessing which it seemed to be, for it became necessary to acquire it at too great risks." He recommended that every school district should have a competent and well-paid medical director, who should devote himself thoroughly and conscientiously to the many hygienic duties of the position. It would not involve an increased expense. On the contrary, it would be to the community a most economical procedure. The Society, as representing the profession of the State, should take such action as would inaugurate and perpetuate a reform in this respect.

The suggestion of the President of the State Society was not acted upon, neither was the recommendation of the heads of medical boards of colleges and hospitals, or the medical societies of this city, when they petitioned, in 1877, the legislature of this State to pass a law creating the office of medical inspector of public schools. The bill, however, passed the Senate, but was defeated in the Assembly by political trickery.

Probably in no city in the world has the medical profession less influence with the powers that be,—legislative bodies,—than in this great commercial centre. This is due in no small degree to the profession keeping itself aloof from the public, and not giving through the secular press instruction on topics pertaining to public health—which duty is enjoined upon them by the Code of Ethics of the American Medical Association. Whilst the parent society in its annual meetings cordially invites the press to report its proceedings, our local societies exclude the press from their meetings, thereby excluding the public from the benefit of the counsel of medical men on the laws of health. This action of the local societies hampers all efforts to advance State medicine in our midst. Even one of the most important of our societies, though one of the functions designated by its charter is the advancement of State medicine, has never established a section on the subject. The physician's sphere of usefulness is of wide range in preparing plans of school-houses, churches, lecture halls, etc. The experienced sanitarian can make suggestions that would be of material service to the architect or builder in the construction of these buildings. Indeed, many of the blunders that are daily made might have been avoided had the plans been submitted to a sanitary expert for revision. We have time only to give an instance of defects of construction in schools and churches. The sanitary defects in the construction of school-houses are now well known everywhere through this country, and especially in our large cities. A single instance will suffice to show this. Much has been said recently, indeed I may say for years past, of the bad sanitary condition of the public schools of the city. And the plea of the Board of Education is, that they cannot correct the defects in the old buildings, but they will take every precaution to insure all sanitary improvements in the new. Having themselves no personal knowledge of school sanitation, and not consulting with those who have, but relying solely on

the officials of the building department, they are building new schools to the detriment of the health of the pupils. An abstract from a report of the *New York Herald*, published on the 8th of last month, will give the Association an idea how far the Board of Education has succeeded in improving the sanitary condition of the schools in the erection of new buildings. I may say here that this inspection was made by two members of this Section; therefore it may be considered authentic. The report is as follows: I give a few of the important points. One of the inspectors, having examined the model of this school-house some time previously, at that time determined at the first opportunity to examine the building, and to see for himself what sanitary improvements there might be in what was presumed to be a model school building. Accordingly, the inspection was made. The building was thoroughly examined from cellar to attic. Space will only allow the result of the examination of the primary department, closets, and cellars, but it will be sufficient to establish the point that the defects of the old are repeated in the new; and shows the necessity of information other than that possessed by builders. The cellar was examined. There are no ground or foul-odored cellar class-rooms in this building, which is something to be thankful for, but if there are none of these disease-breeding cells, there is something akin to them in the dingy, damp floor and mouldy walls of the cellar. The immediately noticeable feature on entering the cellar was the chill, damp, and musty odor, which was abundantly accounted for by the mouldy walls; and not only was the floor damp, but it was in part muddy. This was caused by the defective plumbing, which allowed the water from the street to leak from the time the work was finished, and also by the water flowing in from the bottom of the cellar against a pile of unremoved dirt. The floor throughout was saturated with water, being laid with porous brick on loose earth, without cement. In one place especially, near the bottom of the front cellar door, was noticed a blind drain with perforated covers. On removing the cover it was found to contain stagnant water at the bottom, the earth being thoroughly saturated to a depth of about eighteen inches below the floor with filthy soil-moisture. In brief, with filthy soil-moisture, porous floor, and mouldy walls, only the necessary warmth was needed to produce the most favorable conditions for malaria, and, as if to

intensify these conditions, the ordure side of the cellar was unprovided with windows, doors, or any other openings, by which the cellar could be thoroughly ventilated. There is but one privy-seat for every twenty-five pupils. The urinals are simply pine board without lining.

CHURCHES.

The Physician as an Educator of the Public.—There is, as a rule, even in the newest churches, no improvement in the matter of construction and ventilation. In those buildings that need those adjuncts most, the least provision is made for the comfort or health of the members. It is surprising how little has been said or written on the subject. As to some of its most objectionable features, nothing had appeared until last year. At my suggestion the editor of the *Medical Record* wrote a brief article on the subject. It is true, when the congregations are small, and are in the church for only a short time once a week, little harm is done. When the contrary is the case, however, the mischief is incredible. At the early masses on Sundays in the Catholic churches, in the large parishes, the congregations are immense, quickly replacing each other, without any ventilation except that of opening the windows and doors. Thus it happens that for hours at a time the foul atmosphere is breathed by many congregations without change of air. This is especially the case in the winter season, at the Lenten service, and during missions. During the most solemn portion of the service the deleterious effects of the poisoned air breathed and rebreathed by such vast numbers of persons is especially noticeable.

As the congregations lean forward the pressure on the lungs and diaphragm partly retards respiration, and when this pressure is relaxed, the deep inspiration that naturally follows is succeeded by a chorus of coughing, produced by the exhalation of the lungs irritating the mucous membrane of the upper air-passages.

As has been already shown, it is very difficult to remedy these defects in buildings already constructed. Something, however, might be done to mitigate an evil of which both pastors and people are unconscious. In the churches referred to, a few minutes ought to be allowed between the masses for ventilation, and thus there would be better air, and the necessity of

exposing the people to cold draughts would be avoided. I am convinced that much of our catarrhal affections are contracted in these buildings. The danger of propagation of contagious diseases in an atmosphere such as we find in these churches, especially in wet weather, when the windows are down and doors closed, cannot be estimated.

In addition to crowd-poison, there is another element of contagion—not the least insidious because it is unnoticed—through the medium of clothing of persons attending those sick with contagious diseases. Through this cause, many a worshipper unconsciously carries home with him the seeds of disease. I would respectfully suggest that the reverend pastors advise those in attendance upon the sick referred to to stay away, and not to come to mass while they are in attendance upon the sick. Thus they would render valuable service to the cause of preventive medicine, as their advice would be immediately acted upon.

Unquestionably, one of the most important problems of the day is the intervention of the physician in education. Daily, and I might say hourly, this fact is becoming more apparent. Ornamentation of school-houses, a mania for a smattering of the ologies, has gone on to the serious damage of nerve and brain; instead of physical training keeping pace with the mental, and these conditions conducing to health, we have, as a result of cramming and bad hygienic condition, overstrain of the nervous system, and general physical deterioration. You see the evidence of this abnormal condition in the groups of either sex going to and from our schools of higher education. It would be interesting, if the time permitted, to trace the child's physical condition from home to the earlier class lessons at school.

We see in these draughts on vitality predisposing causes to irritability of brain and nervous system, and these laying the bases in after-life of conditions that shade off to the dangerous boundary line between sanity and insanity.

It was but the other day that this force and strain in education were illustrated in this city. A youth of great promise whom I had known from early childhood, and whose beautiful accent and graceful gesticulation at many a school exhibition thrilled the audience with delight—this hot-house flower of education, after going through the preparatory school, went direct to college, and passed through its curriculum with dis-

tinction. In place of giving this youth time for rest and recuperation, he was hurried on to a theological seminary to prepare for the priesthood. The result was that his health began to fail, and he finally left the seminary a physical wreck, and died in an insane asylum. Scarcely have the notes of his requiem died away, than the doleful knell again strikes the tympanum; this time from New Jersey, and from the famous college of Princeton. It appears that an epidemic broke out in this college, and on last Friday it had been decided by the faculty to adjourn the term, and to close the college. It is reported that upwards of thirty students have been stricken with a disease of a malarial type, thus far resulting in three deaths. The faculty ordered an investigation of the water of the wells in the vicinity of the college, which was found to be contaminated by a cesspool in the immediate vicinity. How much better it would have been had these precautions been taken preceding, rather than after, the outbreak of the epidemic!

Have we not here another evidence of the laxity of sanitary laws in these institutions? Have we not in these instances evidence of the need of the intervention of the physician, in education, whose judicious counsel might have saved valuable lives? There should be in these colleges an annual course of lectures on hygiene; especially in our theological seminaries. These young men are soon to fill important positions, where they will be the mentors of their congregations, and in matters pertaining to public health, would be productive of much good. Instead of their being able to impart information of this character, we find them too often sad examples of ignorance of the laws of health.

Not only is physical training in these institutions ignored, but at their commencements the addresses to the graduates contain nothing which would direct them to govern themselves, or to acquire a knowledge of that wonderful complex machine, the human body. Instead of this being the case, we have in these addresses a paucity of ideas and rhetorical vaporings, which evaporate as rapidly as the exudation from the teeming capillary vessels under a midsummer sun. Gush is the order of the day, and those who pander most to this morbid sensationalism are usually selected on these occasions as the mouthpiece of the Faculty. Though the progress is slow in effecting a reform of this magnitude, yet substantial progress has been made, and

the enthusiasm manifested on this subject by this great National Association at its meetings in Buffalo and Atlanta is evinced by the unanimous passage of a resolution recommending the appointment of a physician to the Boards of Education, to promote the sanitary interests of the schools. We have strong assurance that its potent influence will avail and effect this reform.

Finally, the pioneers of the movement may not live to see this most desirable result accomplished, but the seed that has been planted will assuredly bear fruit, and extend far, and perhaps in some far-off corner in the distant future it will fructify and blossom. The wayside flower is not the less attractive because of its loneliness. The wayfarer is attracted by the fragrance of its odor, and on unfolding its leaves there finds recorded the name of its planter who has passed away long, long ago.

ON THE CRIMINAL USE OF CHLOROFORM.

By J. N. QUIMBY, M.D.,

NEW JERSEY.

My attention has recently been directed to certain facts connected with the use and abuse of chloroform, and from these facts I have derived inferences which I have thought might be interesting and instructive to the profession.

In consequence of the recent murder of policeman Smith in Jersey City, while he and his wife were supposed to be asleep in bed, his wife was arrested as a *particeps criminis.* She denied the charge, and asserted that she had been chloroformed, during sleep, and therefore was innocent of the crime. The State denied this, and contended that it was *impossible* for her to have been chloroformed in that way; that the fumes of the chloroform would have certainly awakened her from her *natural* sleep, and *therefore* she *must* have *known* who the *murderer* or *murderers were.* Here, then, as will be seen, arose a very *nice* and *important* medico-legal question, viz., whether a person could be chloroformed whilst in natural slumber without first being awakened, or, in other words, whether the application of chloroform, properly given, would awaken the person to whom it was applied; or, could such person pass from the natural to an artificial sleep (or chloroform sleep) without being aroused by its application? Mrs. Smith asserted most positively that she was chloroformed while she was asleep in bed with her husband, and knew nothing about the murder until she awoke in a bewildered condition, feeling the cold elbow of her husband pressing against her side. It may be stated here that there was found in the room of the murdered man a bottle partly filled with chloroform, and a folded towel, with bloody finger prints, which Mrs. Smith asserted was upon her face when she awoke: she also described quite accurately the taste, smell, and pungency of chloroform. Without going into further details, the counsel for Mrs. Smith

applied to me to know if it were possible to transfer a person from a natural to an artificial sleep by the use of chloroform without first arousing the sleeper from his natural slumber? I replied that I had never attempted the application of chloroform to a person while in a natural sleep, and the books, as far as I knew, were silent on that point; although I thought there would be no difficulty, if proper care were taken in administering the chloroform, in transferring a person from the natural to an artificial sleep. I was strongly urged on the part of Mrs. Smith's counsel, and in behalf of humanity and justice, to settle by experiment this disputed question. To accomplish this result I made the following experiments: I made arrangements with Mr. A. to enter his room in an hour or two after he had retired, and when he was asleep apply the chloroform, which I did with entire success, transferring him from the natural to the chloroform sleep without arousing him from his natural slumber. I used about three drachms of Squibb's chloroform, and occupied about seven minutes in putting him to sleep.

The second case was a boy, æt. 13, who was suffering from an ingrowing toe-nail. He refused to allow me to touch him with knife or forceps without etherizing him. And when I attempted to apply the ether he screamed and struggled so desperately, that his mother became frightened and asked me to desist from giving him ether. In this dilemma, I advised the mother to take the boy home and put him to bed with a light supper, and I would call at the house between 9 and 10 o'clock that evening, and give him a little chloroform and remove the nail without the boy knowing anything about it. I called at the time agreed upon, with my friend Dr. Cahill, and found the boy quietly sleeping. I applied the chloroform, divided the nail in the centre, and removed the two segments by the application of forceps, without awakening the patient, or his having any knowledge of the operation until next morning, when he awoke, and discovering the condition of his foot, remarked that, had he known "it would not hurt any more than that, he would have had it taken out at the office, and was ashamed that he had made such a fuss about it."

Case No. 3 was a boy, æt. 10, who was brought to my office suffering from a swelling over the lower jaw, which proved to be an abscess due to decayed teeth, but the boy would not let me come near him with either lancet or forceps, so, as in previ-

ous case, I advised his mother to take him home and send him to bed with a light supper, and that I would call at the house after he got asleep, administer chloroform, open the abscess, extract the teeth, and he would know nothing about it. All of which I did without arousing the boy. I remained with the patient about one hour after the operation to attend to any hemorrhage that might occur, and to observe if any change would take place when he would pass from his artificial to his natural slumber again. Finding there was no change in that time, I left, requesting his parents to watch him, and let me know exactly at what hour he awoke. When I called, next morning, they reported that he awoke at 6 o'clock, exclaiming, "I must have swallowed my teeth, for they are both gone!"

Two important inferences may be drawn from the above quoted cases, viz.:—

First. That minor surgical operations, such as opening abscesses, removing ingrowing toe-nails, etc., may be done with perfect safety and much more pleasantly than in the ordinary way.

Secondly. A person somewhat skilled in the use of chloroform may enter the sleeping apartment of a person or persons and administer the drug with evil intentions. Hence the use of chloroform in the hands of the criminal may become an effective instrument in the accomplishment of his nefarious designs.

SUSPICION OF POISONING.

By THOMAS ANTISELL,
DISTRICT OF COLUMBIA.

The administration of Poison is an aid which all classes of society have called in to satisfy private hatred, promote personal gain, advance the designs of avarice, or free themselves from the presence of competitors. Poison has been invoked in all ages of the world for these purposes, and in our times and our communities it is made use of largely to accomplish a desired purpose. The newspapers teem with accounts of the administration of poison, of the trial, of the astuteness of counsel on either side, and frequently of the escape of the party charged with the crime, not by defect of proof satisfactory to ordinary observers or readers, but by some juggle or bamboozle of counsel, who mystify the jury, or work upon their feelings, or raise up some legal side issues which have to be decided before the adjudication on the actual committal of the crime charged can be reached. Hundreds of cases of alleged poisoning are in the hands of the State's prosecuting counsel every year, with the result that a large number of those charged are acquitted on the reasons above stated. While I am of opinion that the tardy and uncertain administration of justice favors the repetition of such offences, I see no step taken by the natural guardians of society or by the literature of the day to put some checks against it. The inducements to secret murder are multiplying yearly. The coarse drugs and remedies of the last century have given way, before the progress of pharmaceutical chemistry, to the preparations of active extracts, pure alkaloids and their salts—morphia, nicotia, strychnia, chloral, chloroform, amyl preparations; and a hundred other articles of deadly potency are on the shelves of our apothecaries' shops; and although every city has its laws to prevent the sale except by the presentation of a physician's prescription, yet such laws are not enforced, and daily almost every one of these and all

other kinds of poison are sold to the public for their own use. If a party be personally known, there is no difficulty in obtaining arsenic, strychnia, chloroform, morphia, etc. Thus, great facilities are open for the purchase of dangerous substances; and facility of obtaining soon leads to application in practice. Again: the newspapers are continually showing up in large capitals that there is on sale a class of preparations intended to be used for the express purpose of destroying life, composed of dangerously active preparations, the taking of which jeopardizes the life of the mother as well as the child.

Medical chemical analysis has not kept pace with industrial and pharmaceutical chemistry, and the medical expert would find some difficulty in detecting the presence of many of the newer preparations of medicine and the arts; he has not directed his attention much in that line. There is no livelihood in the occupation of a medical chemical expert, and what I have now stated as the actual state of society calls for some consideration at the hands of a body like this, whether there ought not to be found in this nation, as in Great Britain, the position of medical analyst for a city, county, or district in connection with the coroner or district attorney, or Board of Health, who could devote his attention to this difficult objective—the detection of these new classes of poisons. The public are thus defenceless against the host of new and active poisons which are furnished to a community not under strong moral restraint, and the medical profession are not, I believe, fully aware of the extent, the public use, and purchase of these active remedies which may daily be found in the hands of the young of both sexes, who, when questioned as to their employment, can give no reasonable reason for possessing them. I do not allude to this state of society as an alarmist, nor do I ask of the profession to become officers of justice or police, but simply that the younger physicians should acknowledge this modern practice of the community dealing with poisons, and say, Are they prepared fully to recognize the evil? But what I wish to occupy you with, in the few observations which I will allow myself to make, is, that there is, I believe, a vast amount of poisoning which goes on in the community, which is distributed more in the richer than in the poorer classes of society, and in which fatal results ensue, without death being followed by any public trial, perhaps not even by any excitement which reaches the public press.

The occasion simply gives rise to a passing remark in the neighborhood concerning the sudden decease, to the expression of surprise of some, or to the innuendo of others who are classed as malicious disturbers of the peace of the community by suggesting motives where there are no facts to support them.

An individual in a family is suddenly taken ill, and after some hours' sickness, during which signs of local irritation of the digestive organs have shown themselves in a severe form, a physician is called in. Under his treatment the patient, if young, strong, and previously healthy, is restored to friends; but if of delicate frame, feeble constitution, or advanced in some chronic disease, gradually succumbs, pays the debt of nature, and the death certificate of the physician records the case as in the class of local diseases—an inflammation, how produced the physician never felt able to account for; perhaps he never looked for any special cause, or suspected that the case was other than an every-day occurrence, where the patient in the course of a wasting disease had committed some indiscretion, it may be, of eating some article of food which, though not poisonous in itself, yet upon a feeble frame produced these fatal symptoms. What was there to suspect, that in a family where all comforts may be had and where the pinch of poverty is never felt, where the support of a family is not burdensome, no causes could be supposed to exist which would lead one member of a family to compass the death of another?

Yet we cannot shut our eyes to the fact that secret murder goes on every day in our large communities; for every now and then a case occurs and is made public, horrifies the community with a nine days' wonder, and is forgotten.

And just as a fatal case of an epidemic indicates the existence of several others, which are not made public in the bills of mortality, because not fatal, so this single published case of family poisoning is the evidence of many similar acts, which, better concealed from public remark, are only recorded in the daily columns of deaths.

The two leading inducements to poison are either illicit love or the desire of gain. In the first case, which is the most frequent cause, the parties involved are chiefly adolescent or of middle life, or the supposed guilty party is so. In the latter case, one party is aged and the other young.

The sexual exciting cause is usually so overpowering that

but little discretion or secrecy is observed, and the suspicion, which was at first confined to the dwelling, becomes shared by the vicinity, and often before the physician is called in, public opinion has prejudged the case. In cases where hopes of property descending become slight, where a belief springs up that it may pass to others, or the party cannot brook the delay of enjoying, great caution and secrecy are usually shown, and the moral or family causes are kept in the background.

The circumstances which lead a physician to believe that an illness or death, accompanied or preceded by suspicious circumstances, was due to poison are classed under five: 1st. The symptoms. 2d. Post-mortem appearances. 3d. Experiments on animals. 4th. Chemical analysis. 5th. Circumstantial evidence.

Of these I propose, at the present time, to treat only of the first, the symptoms, because the object of this paper is to point out some peculiarities in the symptoms distinguishing a case from one of ordinary disease, and bringing it within the class of suspected poisoning.

In fact, my object is to wake up the attention of the physician, especially if he be young, to the value of the evidence derivable from the consideration of the nature of the prominent symptoms, their gravity, duration, the previous condition, and the mental and moral conditions surrounding the case at the present time.

Of course, the first act of the physician is to relieve the distress, and the first and chief symptom complained of may be of such a nature as to render it possible to give that relief without making many inquiries, when the pain, agitation, or exhaustion of the patient prevents a satisfactory reply being given; but this first prescription being given, then it is the duty of the medical man to inquire of himself, What is the immediate cause of these symptoms? Now, to arrive at a safe conclusion, he should remember that symptoms of poison take place, 1st, suddenly; 2d, they so arise in persons previously in good health; and 3d, soon after some substance has been swallowed; 4th, they run a rapid progress to a fatal termination. All of which are more or less the exception in ordinary cases of sickness.

Symptoms.—The symptoms of the invasion of sickness, their succession, and character, may give, if not certain proof of poisoning, at least great probability of it; and if not pointing to the individual, at least to the class of poison. I think I am justi-

fied in saying that it is possible, with careful consideration on the part of the physician, without great sagacity, but with average medical knowledge, and balancing the symptoms with the previous history and the social and moral environment, to distinguish a case of poisoning, whether accidental, suicidal, or homicidal; and I desire to impress this idea, for I think the majority of physicians believe that the lesions are more characteristic than the symptoms, and that an autopsy will solve all the difficulties dependent on a supposed case of poisoning; no doubt it may do so, if the poison be found in the body; but if not, the lesions may not be present, and even if present, are not sufficient proof of poisoning.

Symptoms of Poisoning from Metallic Poisons.—It is well known that homicide is produced mostly by administration of the mineral or metallic poisons. These have many symptoms in common, always local, and generally very intense. The dynamic symptoms are usually of excitement at first and of vital depression subsequently, after the first febrile reaction, which is variable, owing to the stimulus of impression on the gastro-intestinal organs; but if severe, the pulse becomes small, frequent, and irregular, not to be felt or intermitting, horripilation, goose-skin, sense of cold on the surface, hippocratic countenance: if these symptoms are not arrested, gradual faintness comes on, and a fatal termination rapidly ensues, with the mental faculties clear, death with or without tetanic convulsions. This is the result when a large dose of poison has been given, and where ulceration has passed on to perforation. Of these cases, it may be asserted that ordinary local inflammations are not sudden in their origin, rarely have the inflammatory symptoms so well marked at the outset, do not travel so markedly along the intestinal tract, and are not attended at the close with nervous or tetanic symptoms.

Symptoms of Poisoning by Mushrooms.—With such symptoms may be contrasted the action of some articles of food, as mushrooms, fish, mollusks, and crustaceans. The poisonous action of mushrooms is directed upon both the intestinal canal and the nerve-centres. The circulation is rarely affected, for with the majority of the poisoned there is neither any feverish symptom nor undue heat of skin; the symptoms of approach are slow, rarely occurring sooner than four hours after the article has been swallowed, delayed sometimes to twenty hours. This delay is so

general an occurrence that it is worth noting as characteristic; then occur the symptoms of nervous shock, general anxiety, headache, stupor, tendency to sink to floor; then reflex actions of nerve-centres, as the cœliac plexus; then nausea, vomiting, colic, frequent watery stools like cholera, with abdominal pain, blindness, and syncope with convulsions; the blindness is characteristic. Another characteristic is, that these symptoms only occur when mushrooms are in season; dried or preserved articles do not bring on this train of phenomena.

Fish, Mollusks, and Crustacea.—These produce occasionally grave symptoms, rarely mortal; arising sometimes from decomposition of the watery tissues of such animals; but even the freshest of marine animals are poisonous to some, said to be produced by idiosyncrasy, because occurring only in a few where many have partaken. The symptoms are coryza or catarrh suddenly setting in, itching of face and skin, erysipelatous swelling of the face, or tumefaction of the lids—dyspnœa more or less urgent, epigastric oppression, vomiting, headache. These symptoms yield readily to relief of stomach by emesis, bland drinks, tea, and mild alcoholic stimulus, revulsives. Oysters and lobsters produce more severe symptoms than do fish; the diarrhœa is often choleraic; the symptoms, though severe, do not last long, generally passing off as the article is removed from the system. The sympathetic skin affections (roseola, urticaria, erysipelas) are all characteristic of this class. The tongue may be crimson red, and the eyes, ears, and neck covered with red rash.

Smoked Meats, Bouilles, Rechauffées.—Hotel food, re-cooked and furnished in second-class restaurants and dining-rooms, contain poisonous matter produced by decomposition set up by the heat of cooking and keeping warm victuals. The fatty parts are commonly more poisonous than the lean, perhaps from the production of fatty acids or ethers due to the food being kept over the fire. No doubt prussic acid is at times produced in this class of provisions, especially if it be canned food. This poisoning is what is commonly classed as sporadic cholera in city health reports.

Constitutional Symptoms of Poison Irritant.—Besides the local symptoms of an irritant poison, it must be borne in mind that there are general effects shown by dynamic or constitutional symptoms; these succeed the local symptoms quickly, and are classed under the title of vital depression; they are an assem-

blage of symptoms produced by the excess of the poison which dominates over the proper actions of life. The pulse of the patient is small, frequent, hard, irregular, intermittent, the animal heat greatly reduced, particularly in the extremities, which may be positively cold; general goose-skin; shivering, horripilation; the cold perceptible or not to the hand, difficult to be restored by artificial heat. The face is altered, worn, elongated, nose drawn, voice extinct, eyes sunken.

Constitutional Symptoms.—There are also nervous symptoms, spasmodic or convulsive. With these symptoms the intelligence is in good condition; a cold, clammy sweat succeeds, respiration becomes embarrassed, and the urine suppressed; usually such patients succumb in twenty-four to forty-eight hours in a state of asphyxia.

These symptoms, denoting depression of the dynamic power of life, are looked upon by most medical men as not peculiar to an irritant poison, or to the non-performance of any special function of life, but rather to an enfeebled condition of the frame which is not able to recover from the shock which the caustic action of the poison on the alimentary canal by desquamation or solution of the epithelium has produced. This may be a mistaken view, however, and I am anxious to call your attention for a moment to these vital depression symptoms as pathognomonic of the imperfect, or non-performance of the chief, function of the circulatory system; and these symptoms are likely to occur in poisoning from septic substances as well as from irritants, but a clear diagnosis in this case is attainable without much trouble.

The chief of these symptoms is the cold (positively algid) condition of the body—not merely of the exposed surface, but of the covered parts; the belly inside of the thighs, the hands and the feet even; the tongue is cold; but respiration continues, and is not rapid but feeble. The local symptoms have disappeared; but the bodily warmth does not return, and hot applications do not develop it.

Now, in just such a case as this, Andral suspected poisoning, and gave a very grave prognosis, derived from the history of the case, from the scarcely discernible beating of the heart and the feeble pulse accompanied by the mental calm and possession of the intelligence. The individual died, and arsenic was found in the stomach.

The same physician, in another case, that of the Duke Praslin, a near relative of King Louis Philippe, of France, accused of poisoning the duchess, being commissioned to determine the nature of the symptoms and the cause of the disease, expressed himself nearly thus: "The sick person lying on the bed said she was better; her speech was firm, her intelligence clear; no pain in the epigastric region even on pressure, tongue natural, respiration normal. However, with this reassuring condition, two symptoms occupied our attention especially—the extreme smallness and irregularity of the pulse and the beats of the heart, which were hardly appreciable, and the icy coldness of the extremities. These symptoms, which cannot exist without causing great anxiety, may possibly arise from strong moral causes, but they would depend also on the ingestion of poison. I think it necessary in the future to preserve all matters evacuated so that they may be submitted to chemical analysis." The duchess died a few days after, and the matter analyzed yielded arsenic, thus justifying Andral's diagnosis.

Prognosis of Poisoning.—When individual poison is not known, we should always be guarded, as also when effects or symptoms are local and not severe.

But the prognosis is always uncertain when constitutional symptoms are manifested; when they are referred to important organs of life, and occur at a time when local symptoms are developed; when the local symptoms are absent, or when they are accompanied by low temperature (algidity of body), great muscular prostration, irregularity of the pulse, and suppression of urine. If, with these symptoms, there has been no medical treatment at the outset, the prognosis should be very grave. Indeed, the prognosis of poisoning is always grave; it is only of relative degrees of gravity.

In infants the prognosis is always very serious by reason of delicacy of their organs, the thinness of their membranes, the activity of absorption, the irritability of their nervous system, and the small size of their body relatively to the dose of poison.

With regard to the adult, we must balance together the active nature of the poison, if known, its solubility, the quantity administered, the condition of the stomach, as full or empty.

The prognosis is less favorable for women than for men, less also for the young than for the aged, and homicidal poisoning is less grave than suicidal.

For each group of poisons, there are effects which should occupy the attention of the physician in relation to his prognosis.

With *irritant poisons*, the case is more serious in proportion as the cauterization or local action is more superficially extended over stomach and intestines, as the skin is cold, the pulse more feeble, the suspension of urinary secretion more persistent.

With *narcotic poisons*, when there is much dyspnœa or other trouble of respiration.

With *anæsthetics*, when the troubles of respiration are combined with diminished power of circulatory system.

With *tetanic poisons*, when the symptoms of tetanus and asphyxia are combined.

The class of *septic poisons* and slow poisoning do not need allusion to here.

This action of these gases brings me back to the subject of diminished animal temperature as a diagnostic symptom of certain poisons. The cause and phenomena of animal heat are better known now than in Andral's time (half a century since).

We now know that the blood-corpuscles are the oxygen carriers; this gas entering the pulmonary vesicles passes through the walls of the moist cells into the capillaries everywhere in the body, where they temporarily unite with hæmato-crystalline or red coloring matter of the blood. The oxygen is thus transported along the current, which it slowly oxidizes as it goes along. There is enough usually carried to the tissues, principally the muscles, or the oxidizable matters in their juices, and the tissues thus oxidized return their carbonic acid, urea, water, and other products into the blood. These materials, so acted on, yield, as a part of the total result, small portions of carbonic acid, and at every elimination of carbonic acid some heat is produced, and thus by constant oxidation, chiefly of albuminous and carbohydrate matters, so many units of heat are liberated in the blood as to raise it to its normal standard and keep it there. Along with the hæmato-crystalline in the blood-cells is the albumen; the albumen of food dissolved in the stomach passes into the blood, enters in part into the blood-cell, and in part into the serum of the blood. Both the hæmato-crystalline of the blood-corpuscle and the albumen of the serum are oxidized, and give place to fresh hæmato-crystalline and fresh albumen, and heat and dynamic force are the two results of this oxidation of the blood. Thus the animal heat is kept up in

the body as long as the red corpuscles are in a healthy full condition, able to absorb their full share of oxygen, and to yield it to albumen and other matters for generation of heat and force. If oxygen cannot enter the corpuscle, no heat will be produced; if free albumen be not in the blood and air-cells, oxygen cannot unite with it, and heat will not be produced. Certain substances, as poisons which enter in the stomach, dissolve in the gastric juice, and are diffused through the coats of that organ on entering the blood, pass into the interior, and unite with the globulin and hæmato-crystalline of the corpuscle. This done, oxygen cannot unite or attach itself to the red corpuscle; no oxidation, no formation of carbonic acid, no production of heat. Liebig has shown that three parts of arsenious acid may unite with two parts of albumen, and render the blood-corpuscle incapable of absorbing oxygen, and prevent the production of heat. Other bodies act in the same way as arsenic—some corrosive poisons, as mercury bichloride and soluble copper salts. Whatever alters the form of the corpuscle prevents its union with oxygen, and the consequent arterialization of the blood. Hyoscyamus and a number of other active vegetable poisons act similarly, by destroying the sanguification of the blood. Certain gases act in this way; carbonic oxide is the most powerful in this line, uniting at once with the corpuscle, and first expelling and then excluding oxygen. Along with carbonic oxide or the vapors of burning charcoal are included carbonic acid, and especially illuminating gas flowing unburned into an apartment or sleeping room. These gases all kill by exclusion of oxygen from the red corpuscle—carbonic acid negatively, and the others positively.

Perhaps of all nitrogenous substances in the animal body the hæmato-crystalline of the blood is that which by composition is most susceptible of change, by absorbing oxygen, forming compounds of lesser degrees of complexity, and giving off carbonic acid with each step of change, changing from hæmato-crystalline into hæmatine, from hæmatine into hæmatic acid, which, passing through the bloodvessels and reaching the lungs, there causes the evolution of carbonic acid and its final escape from the body. While the corpuscle is thus undergoing change and degradation, it is, at the same time, receiving fresh additions of soluble food albumen which osmose into its cavity, make it plump and regular in outline, and forming the globulin and aiding to form fresh hæmato-crystalline to keep up the life

and function of such cell. Now, in every step of this decomposition and change the tendency is that of progressive metamorphosis, of the escape of carbonic acid, of the production of dynamic energy and nerve force, and of the evolution of heat.

Thus the development of temperature depends upon the effective work of the red corpuscle, and whatever occurrence, either within or without the body, prevents, interferes with, or delays the function of the corpuscle, that is, the seizure and temporary union with oxygen to be soon liberated as carbonic acid and thus making room for fresh oxygen, diminishes or brings to a full stop the development of heat. This function is sometimes checked in adolescence, and we call it chlorosis; in adult life, from fevers and malarial causes, we call it anæmia. In such cases there is no active decomposition of hæmato-crystalline, and a correspondingly diminished temperature of the body indicates the non-performance of arterialization of the blood.

We are ignorant of the direct chemical causes of anæmia and chlorosis, of the reason why the blood-corpuscle does not determine progressive metamorphosis fast enough, and through the usual channel of destruction of the red corpuscle.

But this we do know, that there are certain substances, both inorganic and organic, which have an affinity for albumen, and unite with it; and we also know that oxygen has an affinity for solutions of albumen, dissolves in and unites with the albumen; and we also know that this affinity of oxygen is weak, less than that of many other substances. Thus, the preparations of arsenic, mercury, and copper unite with albumen more readily than oxygen does; and if these bodies be present in the blood, they may probably exert this same preference for albumen which they do outside the body, and thus exclude the blood-cell from its share of oxygen, prevent the arterialization of the blood, and thus produce a rateable reduction of temperature, which may amount in some cases to the algidity alluded to. Lesser degrees of heat production are produced by some vegetable poisons, as hyoscyamus and hemlock, than occur with the mineral poisons. We know that the whole class of anæsthetics diminish the animal temperature, such as alcohol, ether, chloroform, chloral, etc. The action of these bodies is easily comprehended. They are all prone to metamorphosis, are greedy of oxygen, and seize it as fast as it comes from the lung-cells into the capillary, and seize it with greater energy than the blood-corpuscle can, and

the progressive metamorphosis of albumen is checked, and the corpuscle is deprived of its power of producing heat; and thus algidity supervenes.

I have now given three examples to show how the development of animal heat may be suppressed, and if this were the place and occasion, might adduce others; but my only object is to impress on the physician the proximate cause of algidity of the body, so that when a case of illness, with extreme or unexpected absence of warmth supervening, is presented, the medical man should inquire of himself: What is this diminished heat production owing to? and, especially to unite with this inquiry, Is there in this case a clear intellect combined with the bodily cold; and is there absence of dyspnœa or any labored respiration? If the function of respiration is not embarrassed, arterialization of the blood ought to go on *pari passu* with the respiration; that it does not do so is not due to the lungs, but to some condition of the blood; it is clear that oxygen has entered the blood, but the corpuscle has not seized it; why? there must be some substance present in the blood which prevents the corpuscle obtaining it; what is the substance or the class? Is this something produced within the body, or has it come from without? Is it likely to be produced by grief, by impending calamity, or by other moral causes? or is it due to poison? and what poison? Is it a true narcotic, as opium? not likely, for the intelligence is undisturbed. Is it an anæsthetic? not likely, for the odor of breath gives no indication, and the respiratory movements are not markedly lessened in number, and the intellect is clear; also, there is no sleepiness or oppression. These last symptoms are wanting—we push aside the class of anæsthetics. Then there should be asked, Did this condition of the patient come on slowly? are these typhoid conditions? or those of septicæmia? If these be absent, then the class of septic poisons are excluded. Now we fall back upon the previous history of the case. Were there, at the outset, symptoms of gastric irritation or intestinal excitement? What was the attributed origin of such? If this last fact can be shown to have existed, and the origin not satisfactorily explained, we have every reason for having a suspicion of poison; to which must then be superadded the nature of the environment—the relations of the society, family history, the fact of sexual or other irregularities on either side, and the numberless minor concomitant surroundings which may help to confirm the

suspicion that this was a case of administration of an irritant poison.

I hope I may be pardoned for bringing to your notice these crude suggestions on diagnosis in obscure cases of sudden illness, and for pointing out the lines in which our thoughts should run, and our inquiries be shaped, to arrive at a rational diagnosis. I have felt the pursuit of such lines of thought useful for myself, and I submit the conclusions at which I have arrived for the benefit of others travelling the same road; and to travel with ease along this road, the inquirer must be a symptomatologist.

It is not of course my desire to conceal the fact that there are multitudes of cases where the symptoms resemble those of poisoning; where cases of gastro-enteritis run their course with great severity, and terminate fatally, the result being due to the ingestion of ordinary food or dessert, where the articles have been eaten hastily and abundantly. Such cases remove the imputation of poisoning after the autopsy is made. The physician expects to meet these cases. My object has been, not to ignore these, but to awaken the young physician to the fact that the number of concentrated poisons circulating throughout the community is very great, and that cases of accidental or intestinal poisoning must also be numerous.

REPORT OF COMMITTEE ON SANITARIA AND ON MINERAL SPRINGS.

REPORT ON SANITARIA.

In submitting the following report, your committee would refer to the precise terms of their appointment. They were to report "on the establishment of proper sanitaria for consumptives and on the more accurate utilizing of the various mineral wells of our country." As regards the establishment of special sanitaria at any such localities, your committee has felt unwilling to make any suggestions. It is manifest that it would be inexpedient for the American Medical Association to give the authority of its recommendation to any individual place or places as specially adapted for the climatic treatment of phthisis. There are a large number of localities which comply with the various conditions that are recognized as desirable and important in such climates. It is far from being admitted that advantage would follow the establishment of sanitaria for patients with phthisis at such localities. It is evident that the mode of life has equal influence in determining the result of any given case of that disease, with the particular climate and locality in which the patient is placed. Ample opportunities for out-door life and exercise; attractive and healthful occupations; cheerful and invigorating surroundings; abundance of good, wholesome food are among the most powerful influences for good that can be invoked in the treatment of phthisis. The congregation of numbers of such cases in one locality can scarcely conduce to the enjoyment of these essential advantages. Apart from the most injurious moral effects of such association of sick persons, it must be remembered that the sanitaria would be commercial ventures on the part of those who established them, that it would be difficult or impossible to decide and control by whom they should be started and managed, and that consequently the Association, in recommending the establishment of any such

sanitaria, would throw the weight of its authority in aid of business speculations conducted by independent and uncontrolled individuals. Your committee could not therefore recommend any action on the part of this Association looking towards such a result.

REPORT ON MINERAL SPRINGS.

In so far as their duty involved a study of the mode in which the mineral springs of this country might be better utilized, your committee have felt they could best comply with this requirement by presenting a classified list of all reliable analyses of such waters which they could obtain.

The benefits derived from the use of any of these waters directly from the spring, are partly due to the influence of the medicinal agents contained in the water, but partly also to the good effects of change of scene, of bracing climate, of simple habits of living, etc. The material does not exist for a complete study of the clinical effects and value of the mineral springs of North America. Unfortunately, there are few places at which any restrictions are imposed upon either the manner or quantity in which the waters are consumed, or upon the mode of life, diet, etc., of those who are drinking them. In consequence the most erroneous ideas prevail; and it will not be until a definite system is adopted at each such health resort, and carried out under the supervision of competent resident physicians, that we shall secure information concerning the effects of our mineral waters as accurate and reliable as exist in regard to those of European countries. The indications for the use of the chief varieties of mineral waters are, however, so definite and well established that the possession of a classified list of reliable analyses will be of considerable practical importance, and will prepare the way for a more extended and rational employment of these powerful adjuvants.

The following classification has, after careful reflection, been adopted as comprising all the leading varieties represented among American waters. It will often be found that a water will present the marked characteristics of more than one of the varieties. In these instances the water has been included under that heading which is believed to represent its leading and most important ingredient.

In order to render this report of as much practical value as

possible, a list has been furnished, arranged alphabetically under the respective headings, of all mineral springs of which reliable analyses have been published. It is not improbable that a small number of good analyses may have escaped notice, but so extended a search has been made in all directions that it is hoped the omissions may be unimportant. A much larger number of analyzed springs are here tabulated than will be found in any previous compilation. Every effort has been made to secure the analyses in their authentic and accurate form, since flagrant inaccuracies are frequent in the analyses published in the pamphlets that are widely distributed as advertisements of the various springs. In order to render possible the insertion in this place of such extensive lists, the analyses have been abbreviated. The chemical symbols for the ingredients have been used; only such ingredients as exist in sufficient proportion to affect materially the medicinal character of the water have been included; and the number of grains of each ingredient in a gallon of 231 cubic inches is indicated by the figures placed after its symbol. In the case of the chemically indifferent springs no analyses have been given, since no water has been included in this class whose analysis did not fail to show the presence of any ingredient in sufficient proportion to impart the least positive medicinal value. A long list has been appended of the names and localities of springs enjoying more or less local reputation, but of which no reliable analyses could be discovered. This list has been given as a slight indication of the grave defects of our knowledge as to the mineral springs of this country, and as a possible aid to subsequent efforts to render this knowledge more satisfactory. Lastly, a few tables have been given containing full analyses of some well-known waters to serve as illustrations and types of the various sorts of mineral springs.

I. *Chemically Indifferent Waters.*—No natural water has ever been found perfectly free from dissolved substances—either gases or solid matters. This group therefore comprises waters which do not contain a sufficient proportion of any chemical substances to impart a distinctive character, but which still possess peculiarities which may give them some medicinal value. This may be found to depend upon the presence of some unusual substance, as iodine, bromine, or lithium; but frequently it depends only upon the great purity and lightness of the water,

which enables large quantities of it to be drunk. The analyses in Table I. may be given as examples of typically pure water.

Many waters are, however, regarded as chemically indifferent, and are freely used for all technical and economic purposes, and are drunk freely, which contain a larger proportion of solid constituents than this. Thus the water, in a clear state, taken from the Schuylkill River at Fairmount Water Works, contains, according to the analysis of L. Sullivan, 4.16 grains of solid constituents to the gallon of 231 cubic inches. The Croton water (New York) contains more than this, and, according to Dr. Madden,[1] the drinking-water furnished by the Hampstead Company contains 29 grains to one gallon of 231 cubic inches.

On the other hand, the waters of some mineral springs that have acquired high celebrity for their healing virtues, are found to contain a proportion of solid constituents, composed of about the same chemical substances, not much greater than the above drinking-waters. Thus the waters of the Wilsbad Springs, in Germany, which are celebrated for their value in chronic arthritic troubles, contain in a gallon only 12 grains of chloride of sodium, and a little over 3 grains each of carbonate and sulphate of sodium. Examples of the same kind might readily be quoted from among our own well-known springs. Thus the water of Minnequa Springs, Pennsylvania, contains only 10.75 grains of solid constituents in a gallon; that of Cresson Magnesia Springs, Pennsylvania, only 6.9 grains.

CHEMICALLY INDIFFERENT.

Alum Spring, Onslow County, North Carolina.
Artesian Well, Winslow, Camden County, New Jersey.
Bath or Berkeley Springs, Morgan County, Virginia. 74° F.
Black Barren Spring, Lancaster County, Pennsylvania.
Bryant's Springs, Lincoln County, Kentucky. Number I., II., and III.
Capon Springs, Hampshire County, West Virginia. 65.5° F.
Chalk Creek Hot Springs, Chalk Creek, Colorado. 130° F.
Chalybeate Spring, Bedford Springs, Bedford County, Pennsylvania. $CaCO_3$ 9, $CaSO_4$ 3, $FeCO_3$ trace, CO_2 21 cubic inches. 52.7° F.
Chenowith Chalybeate Spring, Bedford County, Pennsylvania.
Cherry Hill Phosphate Spring, Otsego County, New York. $Ca_3(PO_4)_2$ 14.
Concord Spring, Concord, New Hampshire.
Epsom Spring, in Wyandotte Cave, Indiana. $MgSO_4$ 24.
Fayette Spring, Fayette County, Pennsylvania.
Field Spring, Lincoln County, Kentucky.
Glenn Alpine Springs, Burke County, North Carolina.

[1] Health Resorts of Europe, p. 131.

Greencastle Springs, Putnam County, Indiana. $CaCO_3$ 12.
Grove Spring, Lincoln County, Kentucky. $CaCO_3$ 10.
Hawkin's Mineral Springs, Wayne County, Indiana.
Hot Springs, Bath County, Virginia. 101° to 106° F.
Hot Springs, Garland County, Arkansas. 93° to 105° F.
Howard Well, Lincoln County, Kentucky.
Hubbardston Well, Ionia County, Michigan. $CaCO_3$ 17.
Jerusalem Mineral Spring, Canaan, New Hampshire.
Kimberling Springs, Bland County, Virginia.
Lebanon Spring, Columbia County, New York. 73° F.
Leslie Spring, Ingham County, Michigan. $CaCO_3$ 18.
Limestone Spring, Bedford Springs, Bedford County, Pennsylvania. $CaCO_3$ 7, CO_2 21 cubic inches. 51.8° F.
Magnesia Spring (Cresson Springs), Cambria County, Pennsylvania.
Marion Artesian Well, Grant County, Indiana.
Massanutten Spring, Rockingham County, Virginia. 59.7° F.
Mineral Spring, ten feet from May's, Bedford County, Pennsylvania.
Mineral Spring, at the Mound in Madison County, Indiana.
Minnequa Spring, Bradford County, Pennsylvania.
Perry Springs, Pike County, Illinois. $CaCO_3$ 14. 48° to 50° F.
Pine Grove Mineral Spring, Dover, Stratford County, New Hampshire. 45° F.
Rawley Springs, Rockingham County, Virginia.
Red Sulphur Springs, Monroe County, West Virginia. 54° F.
Rock Spring, Lancaster County, Pennsylvania.
Santa Barbara Hot Sulphur Springs, near Santa Barbara, California. Na_2CO_3 17. 112° to 122° F.
St. Helena White Sulphur Springs, No. 7, Napa County, California. $NaCl + Na_2SO_4$ 27. 64.5° to 97° F.
Stone Sulphur Spring, Lincoln County, Kentucky.
Stremmel's Gettysburg Lithia Spring, Adams County, Pennsylvania.
Stribling's Chalybeate Spring, Augusta County, Virginia.
Stribling's Sulphur Spring, Augusta County, Virginia.
Sweet Springs, Bedford, Pennsylvania. Temperature 52.7° F.
Van Cleuve's Mineral Spring, Crawfordsville, Indiana. $CaCO_3$ 10.
Versailles Springs, Brown County, Illinois. 58° F.
Warner Spring, Albion, Michigan. $Ca(HCO_3)_2$ 17.
White Cliff Mineral Springs, Monroe County, Tennessee. Three grains of $Mg(HCO_3)_2$.
Yellow Springs, Green County, Ohio. 52° F.

II. *Acidulous Waters*, which owe their virtues chiefly to the presence of free carbonic acid gas. They usually owe their origin to the gradual decomposition of iron pyrites in the crystalline rocks, by which sulphuric acid is formed. The latter, in contact with carbonates, causes the liberation of carbonic acid gas which is absorbed by the water and imparts to it its acid properties. It is needless to say that for the production of an acidulous water, the amount of carbonic acid must be in excess of the amount required for combination (forming car-

bonates or bicarbonates) with any chemical substances contained in the water; and the strength of the acidulous water is to be determined only by the proportion of such really free carbonic acid. Acidulous waters vary greatly in the amount of their solid constituents, and thus different examples of this class also possess the properties of some one of the other groups of mineral waters.

Those which contain abundant free carbonic acid gas with a minimum amount of solid constituents, are chiefly useful as grateful beverages, as stimulants to digestion, and as diluents. (See Table II.)

Undoubtedly we possess in America many typical examples of such waters; but in very few instances have reliable analyses been furnished or has the water been brought before the profession. The following analyses will give a good idea of the properties of some of the most reliable and valuable. We have also given in full in Table II. the analysis of the Clysmic Water of Waukesha, Wisconsin, which has been recently introduced to the market.

Even in these, and especially in the Apollinaris, it will be observed that the amount of sulphates and carbonates is sufficient to produce some slight medicinal action if the water were drank freely and for a considerable time. Both of these waters, and all of their class, contain a large amount of free carbonic acid, which renders them effervescing, sparkling, and acidulous.

We shall have occasion to report numbers of acidulous springs in various parts of America, but most of them contain such pronounced quantities of various solid constituents as to properly refer them to another class.

ACIDULOUS.

Bladon Sulphur Spring, Choctaw County, Alabama. CO_2 86 cubic inches, and H_2S 1.30 cubic inches.

Bladon Vichy Spring, Choctaw County, Alabama. CO_2 110 cubic inches.

Clarendon Gaseous Spring, Rutland County, Vermont. CO_2 46.16 cubic inches. 50° F.

Clysmic Spring, Waukesha, Wisconsin. $Mg(HCO_3)_2$ 14, $Ca(HCO_3)_2$ 16, CO_2 amount not given.

Summit Soda Springs, Alpine County, California. NaCl 26, $Ca(HCO_3)_2$ 43, CO_2 186.35 cubic inches.

Sweet Chalybeate Spring, Alleghany County, West Virginia. $CaSO_4$ 33, CO_2 104 cubic inches. 75° F.

Sweet Springs, Monroe County, West Virginia. $CaCO_3$ and $CaSO_4$ 43, CO_2 85.86 cubic inches. 74° F.

III. *Saline Waters* or Brines, which are simply solutions of the halogen compounds of the alkalies. Chloride of sodium, or common salt, is the substance which appears most constantly and in largest proportion in waters of this class. Indeed, in many saline waters it is the only halogen compound contained, the other solid ingredients being various alkaline or earthy salts in inconsiderable proportion. In a few instances, in addition to chloride of sodium, iodine and bromine exist in combination, usually in very small amounts. Saline waters are either thermal (*i. e.*, the water possesses a high temperature) or cold. They occasionally contain abundant free carbonic acid.

As an example of the average composition of such waters, the analysis of the well-known Wiesbaden Spring is given. (See Table III.)

The amount of chloride of sodium in such waters varies greatly, from Baden Baden (128 grains to the gallon), to Kissingen (360 grains to the gallon), to Hall (896 grains to the gallon), to St. Catharine, Ontario (20,000 grains to the gallon). The Syracuse Salt Well of New York contains 6912 grains to the gallon; and the Liverpool Salt Well of New York contains 7680 grains to the gallon.

Iodine and bromine, which are found in some saline waters, exist in such minute quantities that they can hardly play any considerable part in the production of the effects which are seen to follow the use of these waters. Thus, in regard to Kreuznach (Germany), one of the most celebrated iodo-bromated saline waters in the world, Brown (Curative Effects of Baths and Waters) remarks: "Scrofulous children are given the Elise Spring up to 20 or 30 ounces daily, a quantity which contains $\frac{1}{25}$ to $\frac{1}{16}$ of one grain of iodide of magnesium, with about $\frac{1}{3}$ to $\frac{1}{2}$ of one grain of bromide of magnesium; so that the child would receive vastly less than the amount of these salts which have been shown by experience to be required for production of an alterative effect." There is no iodo-bromated saline spring in America of whose value any higher opinion can be expressed. So that, while admitting that the minute quantities of these alteratives which are actually received by any one using such waters are productive of their fullest medicinal effects, it must be evident that the excellent curative effects which undoubtedly follow their use are in great part due to the other saline ingredients and to the large amount of water itself consumed.

SALINE.

Akesion Spring, Brownville, Saline County, Missouri. NaCl 756, $MgCl_2$ 87, $CaCl_2$, $CaSO_4$, and $CaCO_3$, 173.

Albany Artesian Well, Ferry Street, Albany, New York. NaCl 504, $FeCO_3$ 8, $MgCO_3$ 16, Na_2CO_3 40, CO_2 224 cubic inches. 51° to 52° F.

Black Sulphur Spring, Bath County, Kentucky, 58 grains NaCl.

Borland Well, Wood County, West Virginia. NaCl 240, $NaHCO_3$ 112, Na_2SO_4 38.

Bryant's Spring, No. 4, Lincoln County, Kentucky. Na_2SO_4 12, NaCl 54.

Cañon City Mineral Springs, Cañon City, Fremont County, Colorado.
- Iron Duke. NaCl 80, Na_2CO_3 74, $MgCO_3$ 15.
- Little Ute. NaCl 114, Na_2CO_3 74, $MgCO_3$ 14.
- Big Ute. NaCl 132, $CaCO_3$ 43, $MgCO_3$ 15.
- Aqua Vida. NaCl 121, Na_2CO_3 73, $MgCO_3$ 18.
- Congress. NaCl 38, $MgCO_3$ 18.

Des Chutes Hot Springs, Wasco County, Oregon. Na_2CO_3 and NaCl 55. 143° to 145° F.

Halleck's Spring, Oneida County, New York. NaCl 624, $CaCl_2$ 104, $MgCl_2$ 32, $CaSO_4$ 40.

Highgate Springs, Franklin County, Vermont. NaCl 23, Na_2CO_3 14.

Iola Mineral Well, Kansas. NaCl 782, $Ca(HCO_3)_2$ 49, $Mg(HCO_3)$ 21, KCl 14.

Kanawha Saline Spring, Kanawha Valley, West Virginia. NaCl 240, Na_2HCO_3 112, Na_2SO_4 38.

La Fayette Artesian Well, Tippecanoe County, Indiana. NaCl 325, $MgCO_3$ and $MgCl_2$ 59, $CaSO_4$ 56. 55° F.

Lansing Spring, Lansing, Ingham County, Michigan. NaCl 267, Na_2CO_3 65, $CaCO_3$ 62, CO_2 198 cubic inches. 53.5° F.

Liberty Hot Springs, or Wagonwheel Gap Springs, Morrison, 12 miles from Denver, Colorado.
- No. 1. Na_2CO_3 41, NaCl 17. Temperature 150° F.
- No. 3. Na_2CO_3 84, NaCl 19. Temperature 140° F.

Livingston Artesian Well, Livingston, Sumpter County, Alabama. NaCl 295 grains. 68° F.

Lodi Artesian Well, Wabash County, Indiana. NaCl 502, $CaCl_2$ and $CaSO_4$ 104, $MgCl_2$ 54.

Mineral Spring, Walnut Hill, Fayette County, Kentucky. NaCl 234, $MgCl_2$ 19.

Mineral Water, Paint Lick, Madison County, Kentucky. NaCl 27, Na_2CO_3 16.

Otts Well, Crawford County, Indiana. NaCl 3781, $CaCO_3$ 323, $MgCO_3$ 86, $FeCO_3$ 12, $MgSO_4$ and Na_2SO_4 58.

Parnassus Springs, 12 miles southwest of Pueblo, Colorado.
- No. 1. Na_2CO_3 74, NaCl 60. Temperature 66° F.
- No. 2. Na_2CO_3 69, NaCl 61. Temperature 72.5 F.
- No. 5. Na_2CO_3 43, NaCl 31. Temperature 59° F.

Paso Robles Hot Sulphur Springs, San Luis, Obispo County, California.
- Main Spring. NaCl and Na_2CO_3 49, CO_2 17.48 cubic inches. 112° F.
- Mud Spring. NaCl and Na_2CO_3 108, CO_2 79 cubic inches. 122° F.

Salina Spring (Mr. Peterson), near Tarentum, Pennsylvania. NaCl 1927, $CaCl_2$ 501, $MgCl_2$ 126, $MgCO_3$ 80, $CaCO_3$ 161.

Salt Spring, near Alba, Bradford County, Pennsylvania. NaCl 4694, $CaCl_2$ 780, $MgCl_2$ 111, $Fe(HCO_3)_2$ 5.

Salt Sulphur, Bath County, Kentucky. NaCl 166, MgCl 55.
Salt Water, near Conemaugh, near Saltzburg, Indiana County, Pennsylvania, NaCl 4165, $CaCl_2$ 918, $MgCl_2$ 232.
Sheboygan Well, Sheboygan, Wisconsin. 307 grains of NaCl. 59° F.
South Park Sulphur Springs, South Park, Colorado. NaCl 97, Na_2CO_3 77.
Sweet Springs, Saline County, Missouri. NaCl 90, $MgCl_2$ 22.
Terre Haute Spring, Clay County, Indiana. NaCl 316 grains.
Thomas Well's Brine, Fountain County, Indiana. NaCl 4573, $CaCl_2$ 215, $CaCO_3$ 107, $MgCl_2$ 53.
Verona Spring, Oneida County, New York. NaCl 720, $CaSO_4$ 60, $CaCl_2$ and $MgCl_2$ 68.
Waterloo Well, Waterloo, Wisconsin. 60 grains of NaCl and $NaNO_3$.
Williams Mineral Well, Woodford County, Kentucky. NaCl 137, $MgCl_2$ 16.

IV. *Aperient Saline Waters.*—The laxative properties of these waters are due to the presence of varying quantities of sulphates of the alkalies and alkaline earths. These salts are usually formed by the action of sulphuric acid, resulting from the decomposition of iron pyrites, upon silicates and carbonates. They may and frequently do also contain considerable quantities of chloride of sodium, and of various carbonates. Such waters are found both as thermal and cold springs; and may also contain abundant free carbonic acid, rendering them effervescing and acidulous. The amount of sulphates contained varies so greatly that some of these waters may almost be used for ordinary drinking purposes, while others are actively and powerfully purgative.

The analysis (Ragsky) of the well-known Sprudel Spring at Carlsbad (Germany) affords a good example of the milder varieties of these waters (see Table IV.).

The temperature of the Sprudel is 170°; that of the Mahlbrunner Spring, at Carlsbad, is 142°; and that of the Schlossbrunner and of the Theresienbrunner is 130°.

On the other hand, we have also given in Table IV. analyses of some of the more powerful purgative waters of this class.

APERIENT SALINE.

Alburgh Springs, Grand Isle County, Vermont, 15 grains of Na_2SO_4 and K_2SO_4.
Avon New Bath, Livingston County, New York. $CaCO_3$ 27, Na_2SO_4 and NaCl 44. 50° F.
Ballston Springs, Saratoga County, New York—
Sans Souci. NaCl 144, $CaCO_3$ 43, $Mg(HCO_3)_2$ 39, $FeCO_3$ 6.
United States. NaCl 425, $CaCO_3$ 29, CO_2 244 cubic inches. 50° F.
Washington Lithia Well. NaCl 645, $Mg(HCO_3)_2$ 158, $CaHCO_3$ 178, Li_2HCO 11, $Fe(HCO_3)_2$ 2, CO_2 338 cubic inches. 49° F.

Ballston Artesian Lithian Well. NaCl 750, $CaCO_3$ 165, $MgCO_3$ 107, $Li_2CO_3$6, CO_2 426 cubic inches. 52° F.

Franklin Artesian Well. NaCl 659, $Ca(HCO_3)_2$ 202, $Mg(HCO_3)_2$ 178, $NaHCO_3$ 94, KCl 34, $LiHCO_3$ 7, CO_2 460 cubic inches. 52° F.

Bedford Springs, Bedford County, Pennsylvania—

Anderson magnesia. $CaSO_4$ 100, $MgSO_4$ 40. 57.2° F.

Anderson magnesia. Iron $CaSO_4$ 90, $MgSO_4$ 39, $FeCO_3$ trace. 57.2° F.

Bedford Sulphur. $CaSO_4$ 73, $MgSO_4$ 33, H_2S trace, CO_2 6 cubic inches. 62.6° F.

Benham's Carburetted Saline Spring, Crawford County, Indiana. NaCl 4850, $CaCO_3$ 640, $MgCO_3$ 173, $MgSO_4$ 84, Na_2SO_4 21, $FeCO_3$ 9.

Bryant's Mineral Well, Lincoln County, Kentucky. $MgSO_4$ 53, $CaSO_4$ 56.

Butterworth Springs, Kent County, Michigan. $CaSO_4$ 75, $MgCl_2$ 42. 54° F.

Charleston Artesian Well, Charleston, South Carolina. Na_2CO_3 52, $MgSO_4$ 12. 87° F.

Cherry Valley Bath House Spring, Otsego County, New York. $CaSO_4$ 85, $MgCO_3$ and $MgSO_4$ 42, Na_2SO_4 11.

Cooper's Artesian Well, Hinds County, Mississippi. $MgSO_4$ 23, Na_2SO_4 12, $CaSO_4$ 42. 50° F.

Crab Orchard Springs, Lincoln County, Kentucky. $MgSO_4$ 205, Na_2SO_4 59.

Crab Orchard Salts. Contain in 100 grains $MgSO_4$ 63.

Eaton's White Sulphur Spring, Crawford County, Ind. NaCl 121, $MgSO_4$ 42, $MgCO_3$ 16, $CaCO_3$ 46. 59° F.

Fruit Port Artesian Well, Ottawa County, Michigan. NaCl 464, $CaCl_2$ 111, MgCl 47, Na_2SO_4 46, $FeCO_3$ 5.44 grains. 48° F.

Glenn's Springs, Spartanburg's District, South Carolina. $MgSO_4$ 96, Na_2SO_4 40, H_2S 24 cubic inches.

Harrodsburg Springs, Mercer County, Kentucky—

Greenville Spring. $MgSO_4$ 129, $CaSO_4$ 88, $MgCO_3$ 23.

Saloon Spring. $MgSO_4$ 223, $CaSO_4$ 82, $Fe(HCO_3)_2$ 4.

Hartford Sulphur Spring, Crawford County, Indiana. NaCl 59, $MgSO_4$ and Na_2SO_4 20, $CaCO_3$ 20.

Hot Sulphur Springs, Middle Park, ninety miles from Denver, Colorado. Na_2SO_4 25, Na_2CO_3 22. Temperature 110° to 117° F.

Idaho Warm Springs, Clear Creek County, Colorado. Na_2CO_3 31, Na_2SO_4 29. 106° F.

Indian Spring, Butts County, Georgia. $MgSO_4$ 572, $CaSO_4$ 57, K_2SO_4 27. 63° F.

Irvine Spring, Estell County, Kentucky. $MgSO_4$ 263, $CaSO_4$ and $CaCO_3$ 62.

Le Roy Springs, Le Roy Station on the Northern Pacific Railroad, Wyoming. Na_2SO_4 117, NaCl 270, $MgCO_3$ 51, $CaCO_3$ and $CaSO_4$ 100.

Louisville, or Du Pont's Artesian Well, Louisville, Kentucky. NaCl 622, $MgSO_4$ 77, Na_2SO_4 72.

Midland Spring, Midland County, Michigan. K_2SO_4 68, Na_2SO_4 18. 47° F.

Mineral Spring, in dry wash leading from Detrital Valley (forty mile Desert) to the Colorado River, Arizona. NaCl 232, $MgSO_4$ 101, $CaSO_4$ 76, Na_2SO_4 30.

Pagosa Hot Springs, twenty-five miles from the headwater of the San Juan River, Colorado—

No. 1. Na_2SO_4 129.

No. 2. Na_2SO_4 129.

No. 3. Na_2SO_4 131.

No. 4. Na_2SO_4 131.

Porter's Sulpho-Chalybeate Spring, Denver, Colorado. Na_2SO_4 27, $CaCO_3$ 10.
Rhea Springs, Rhea County, Tennessee. 70 grains of $CaSO_4$.
Saratoga Springs, Saratoga County, New York—
  Walton or Iodine. NaCl 187, $MgCO_3$ 75, $CaCO_3$ 26, CO_2 330 cubic inches.
  Triton Spring. NaCl 238, $CaCO_3$ 91, $MgCO_3$ 42, Li_2CO_3 3 grains, CO_2 360 cubic inches. 60° F.
  Saratoga Alum. NaCl 565, $CaCO_3$ 57, $MgCO_3$ 20, CO_2 212 cubic inches.
  High Rock. NaCl 390, $CaCO_3$ 92, $MgCO_3$ 33, CO_2 408 cubic inches. 52° F.
  Congress. NaCl 400, $CaCO_3$ 100, $MgCO_3$ 75, NaBr 9, Li_2CO_3 3, CO_2 392 cubic inches. 52° F.
  Hathorn. NaCl 510, $CaCO_3$ 118, $MgCO_3$ 105, CO_2 376 cubic inches.
  Empire. NaCl 507, $CaCO_3$ 76, $MgCO_3$ 25, CO_2 344 cubic inches.
  Columbian. NaCl 267, $CaCO_3$ 68, $MgCO_3$ 28, $FeCO_3$ 6, CO_2 272 cubic inches.
  Pavilion. NaCl 460, $CaCO_3$ 83, $MgCO_3$ 45, Li_2CO_3 6, CO_2 328 cubic inches.
  United States. NaCl 142, $CaCO_3$ 65, $MgCO_3$ 43, Li_2CO_3 3, CO_2 240 cubic inches.
  Seltzer. NaCl 134, $CaCO_3$ 62, $MgCO_3$ 24, CO_2 320 cubic inches. 50° F.
  Geyser. NaCl 562, $CaCO_3$ 118, $MgCO_3$ 83, Na_2CO_3 49, Li_2CO_3 4, CO_2 456 cubic inches. 46° F.
  Star. NaCl 398, $CaCO_3$ 86, $MgCO_3$ 37, CO_2 400 cubic inches. 52° F.
  Red Spring. NaCl 70, $CaCO_3$ 59, $MgCO_3$ 21.
  Eureka. NaCl 117, $CaCO_3$ 41, $MgCO_3$ 29, $FeCO_3$ 3, CO_2 232 cubic inches.
  Excelsior. NaCl 371, $CaCO_3$ 77, $MgCO_3$ 32, $FeCO_3$ 3, Na_2CO_3 15.
  Hamilton. NaCl 299, $CaCO_3$ 98, $MgCO_3$ 39, $FeCO_3$ 5, Na_2CO_3 34, CO_2 320.
  Crystal. NaCl 336, $CaCO_3$ 71, $MgCO_3$ 45, Li_2CO_3 3, CO_2 312 cubic inches. 50° F.
  Glacier. NaCl 702, $CaCO_3$ 158, $MgCO_3$ 115, Li_2CO_3 6, KCl 40, CO_2 465.44 cubic inches.
  Union. NaCl 458, $CaCO_3$ 67, $MgCO_3$ 65, CO_2 384.96 cubic inches. 48° F.
Seltzer Spring, Boulder County, Colorado. Na_2SO_4 108, $Ca(HCO_3)_2$ 43. Temperature, 40° F.
Spring Lake Well, Ottawa County, Michigan. NaCl 406, $CaCl_2$ 113, Na_2SO_4 47, MgCl 36. 52° F.
Warm Spring, at edge of Salt Lake City, Utah. $MgSO_4$ 60, NaCl 234.
Warren Springs, Warren County, North Carolina. CaCl 11, $CaSO_4$ and $CaCO_3$ and $CaCl_2$ 10, $MgSO_4$ 8.
White Creek Springs, twelve miles from Nashville, Tennessee. 55 grains of $CaCO_3$ and $CaSO_4$.

V. *Alkaline Waters.*—In some cases the products of the decomposition of the silicates are chiefly sulphates and carbonates of the alkalies; and if the latter are abundant they will, on account of their extreme solubility, render the water decidedly alkaline. These waters are frequently, as in the case of the Vichy Springs, which are by far the most perfect example of this class, highly charged with free carbonic acid. They are also met with both as thermal and cold springs. In the purest alkaline waters there are scarcely any solid ingredients of

importance except the carbonates of the alkalies. This is seen from analyses of two of the most celebrated of the Vichy Springs. See Table V.

The amount of carbonic acid (free) in the Vichy waters is estimated at from 90 to 100 cubic inches to the gallon of 231 cubic inches, and have a temperature of from 80° to 105° F.

There are numerous other well-known foreign alkaline springs which contain, in addition to their pure alkaline ingredients, considerable quantities of halogen compounds or of laxative sulphates, and thus acquire a mild medicinal character.

ALKALINE.

Adams Springs, Lake County, California. $MgCO_3$ 99, Na_2CO_3 57, $CaCO_3$ 29, CO_2 300 cubic inches.

California Seltzer Springs, Mendocino County, Cal. $CaCO_3$ 67, $MgCO_3$ 43, Na_2CO_3 35.

Clinton Spring, Cliff Street, New York City. NaCl 58, $MgCO_3$ 35, $CaCO_3$ 30, CO_2 68½ cubic inches.

Hot Borate Spring, Borax Lake, Lake County, California. NH_4HCO_3 108, $Na_2O + 2B_2O_3 + 10H_2O$ 103, NaCl 85, $NaHCO_3$ 77.

Indian Spring, Martin County, Indiana. NaCl 39, $CaCO_3 + CaSO_4$ 53, $MgCO_3 + MgSO_4$ 49. 53° F.

Olympian Springs, Bath County, Kentucky. NaCl 166, $MgCl_2$ 55.

Richfield Sulphur Spring, Otsego County, New York. $CaSO_4$ and $Ca(HCO_3)_2$ 92, $MgSO_4$ and $Mg(HCO_3)_2$ 39, NaCl 21, H_2S 4 cubic inches. 48° F.

Sharon Magnesia Spring, Schoharie County, New York. $CaSO_4$ 76, $MgSO_4 + Mg(HCO_3)_2$ 53, H_2S 3.3 cubic inches. 48° F.

Snowden Mineral Spring, Valley of Yoncalla, two miles south of Drain's Station, Oregon. MgCl 145, NaCl 173, $CaCl_2$ 115.

St. Louis Magnetic Spring, St. Louis, Gratiot County, Michigan. $NaHCO_3$ 86, $Ca(HCO_3)_2$ 56, $CaSO_4$ 54. 50° F.

West Baden Springs, Orange County, Indiana. NaCl 78, $CaCO_3$ 41, $MgCO_3$ 39, $MgSO_4$ 36, $MgCl_2$ 11.

Wilhoit Springs, Clackamas County, Oregon. $MgCO_3$ 85, Na_2CO_3 88, NaCl 201, FeO 6, CO_2 338.41 cubic inches.

Wilson's Saline Chalybeate, Lexington, Fayette County, Kentucky. $CaCl_2$ 33, $MgCl_2$ 18, $MgCO_3$ 15, $FeCO_3$ 2½, CO_2 33 cubic inches.

VI. *Calcareous or Earthy Waters.*—These waters owe their peculiar chemical properties to sulphates and carbonates of lime and of other alkaline earths, which are frequently held in solution by an excess of carbonic acid. Sulphate of lime is the salt to which the efficiency of such waters is specially attributed. It is, however, still open to doubt as to how far this substance, which is highly indigestible and incapable of absorption, can be the truly active ingredient of such waters, containing, as

they usually do, a considerable number of other chemical substances. Much the same may be said in regard to carbonate of lime, which, however, is of much more constant occurrence in drinking and mineral waters; and, indeed, exists in larger proportion in some waters of other classes than in those which are included among so-called calcareous waters.

The analyses we furnish will give a good idea of the composition of well-known waters of this class. See Table VI.

CALCAREOUS.

Alleghany Springs, Montgomery County, Virginia. $CaSO_4$ 96, $MgSO_4$ 42. 53° F.

Aurora Saline Springs, Aurora, Oregon. CaCl 474, NaCl 356.

Beliot Iodo-Magnesian Springs, Beloit, Wis. $Ca(HCO_3)_2$ 15, $Mg(HCO_3)_2$ 12, a trace. 48° F.

Bishop's Well, New Brunswick, New Jersey. $CaSO_4$ 149, $MgSO_4$ 31.

Blue Ridge Spring, Botetourt County, Virginia. $CaSO_4$ 100, $MgSO_4$ 48.

Carlisle Spring, on Arkansas River, twenty miles above Puebla, Colorado. $CaCO_3$ 22, $MgCO_3$ 11. 65° F.

Chalybeate Spring, Estell County, Kentucky. $CaSO_4$ 17, $CaCO_3$ 9, $MgSO_4$ 10, $FeCO_3$ 2, CO_3 32 cubic inches.

Cherry Valley North Spring, Otsego County, New York. $CaSO_4$ 150, $MgCO_3$ 10.

Chittenango Cave Spring, Madison County, New York. $CaSO_4$ 106, $MgCO_3$ 14, CO_2 25.6 cubic inches, H_2S 3.2 cubic inches. 49° F.

Chittenango Magnesia Spring, Madison County, N. Y. $CaSO_4$ 81, $MgCO_3$ 13, CO_2 36 cubic inches. 49° F.

Clifton Springs, Ontario County, New York. $CaSO_4$ and $CaCO_3$ 79, $MgSO_4$ and $MgCO_3$ 30.

Colorado or Manitou Springs, Colorado Springs, Colorado.
- Navajoe. $CaCO_3$ 72, Na_2CO_3 70, $MgCO_3$ 18. 50.2° F.
- Manitou. $CaCO_3$ 62, Na_2CO_3 26, $MgCO_3$ 12. 56° F.
- Ute Soda. $CaCO_3$ 22, Na_2CO_3 13.
- Shoshone. $CaCO_3$ 61, Na_2CO_3 50. 48.5° F.
- Iron Ute. $CaCO_3$ 33, Na_2CO_3 33, $MgCO_3$ 8. 44.3° F.
- Little Chief. $CaCO_3$ 42, Na_2SO_4 29, NaCl 27. 43° F.

Catoosa Springs, Catoosa County, Georgia.
- No. 1. All Healing. $CaSO_4$ 39, $MgSO_4$ and $MgCO_3$ 34.
- No. 2. Red Sweet. $CaSO_4$ 44, $MgSO_4$ and $MgCO_3$ 38.
- No. 3. Cosmetic. $CaSO_4$ 42, $MgSO_4$ and $MgCO_3$ 36.
- No. 4. Chalybeate. $CaSO_4$ 42, $MgSO_4$ and $MgCO_3$ 35, $FeCO_3$ trace.
- No. 5. Magnesia. $CaSO_4$ 42, $MgSO_4$ and $MgCO_3$ 36.
- No. 6. Congress. $CaSO_4$ 39, $MgSO_4$ and $MgCO_3$ 34.
- No. 7. Alum. $CaSO_4$ 41, $MgSO_4$ and $MgCO_3$ 36, Al 1.
- No. 8. Black Sulphur. $CaSO_4$ 41, $MgSO_4$ and $MgCO_3$ 36.
- No. 9. White Sulphur. $CaSO_4$ 45, $MgSO_4$ and $MgCO_3$ 40.
- No. 10. Buffalo. $CaSO_4$ 45, $MgSO_4$ and $MgCO_3$ 42.

East Clarion Spring, Elk County, Pennsylvania. NaCl 337, $CaCl_2$ 52, $MgCl_2$ 15, $BaCl_2$ $1\frac{3}{4}$.

Eaton Rapids Well, Eaton Rapids in Eaton County, Michigan.
Frost Well. $CaCO_3$ and $CaSO_4$, 42 grains.
Shaw Well. $CaCO_3$ and $CaSO_4$, 69 grains.
Mosher Well. $CaCO_3$ and $CaSO_4$, 65 grains.
Stirling Well. $CaSO_4$, 46 grains.
Bordine Well. $CaCO_3$ and $CaSO_4$, 85 grains.

Gettysburg Katalysine Spring, Adams County, Pennsylvania. $Ca(HCO_3)_2$ 16, $MgSO_4$ 7. 57° F.

Guilford Spring, Guilford Centre, Windham County, Vermont. 15.18 grains $CaCO_3$.

Healing Spring, Bath County, Virginia. $CaCO_3$ 18. 88° F.

Holston Springs, Scott County, Virginia. $CaSO_4$ 20, $MgSO_4$ 13. 68.5° F.

Hot Springs, Canon City, Fremont County, Colorado. $CaCO_3$ 32, $MgCO_3$ 12, NaCl 18. Temperature 95° to 102° F.

Liberty Hot or Wagonwheel Gap Springs, Morrison, twelve miles from Denver, Colorado, No. 2. $CaCO_3$ 18.

M'Carthy's Spring, Huntingdon County, Pennsylvania. 95 grains of $CaSO_4$ and $Ca(HCO_3)_2$. 42 grains $MgSO_4$.

M'Vittey's Spring, Huntingdon County, Pennsylvania. $Ca(HCO_3)_2$, 10 grains.

Mineral Park Bitter Spring, Arizona. $CaSO_4$ 69, $MgSO_4$ 38.

Montvale Spring, Blount County, Tennessee. 75 grains of $CaSO_4$. 60° F.

Newburg Springs, Orange County, Vermont. 17.60 grains $CaCO_3$.

Red Sulphur, Estell County, Kentucky. $CaCO_3$ and $CaSO_4$22, CO_2 40 cubic inches, H_2S .56 cubic inches.

Richfield Magnesia Spring, Otsego County, N. Y. $CaSO_4$ and $Ca(HCO_3)_2$ 55, $MgSO_4$ and $Mg(HCO_3)_2$ 23, CO_2 5 cubic inches. 53° F.

Tate Epsom Springs, Granger County, Tennessee. $CaSO_4$ 161 grains. 55° F.

Warm Spring, Bath County, Virginia. $CaSO_4$ 15. 98° F.

Warren Springs (cold sulphur), Warren County, North Carolina. $CaSO_4$ 31.

Waukesha Springs, Waukesha County, Wisconsin.
Bethesda Spring. $Ca(HCO_3)_2$ 17. 60° F.
Glenn Mineral Spring. $Ca(HCO_3)_2$ 16.
Waukesha Mineral Rock Spring. $Ca(HCO_3)_2$ 10.
Fountain Spring. $Ca(HCO_3)_2$ 14.
Hygeia Spring. $Ca(HCO_3)_2$ 17.

White Sulphur Springs, Greenbrier County, West Va. $CaSO_4$ 74, $MgSO_4$ 19, H_2S 1.54 to 3.03 cubic inches. 62° F.

Yellow Sulphur Springs, Montgomery County, Virginia. $CaSO_4$ 63, $MgSO_4$ 21. 55° F.

VII. *Chalybeate Waters.*—This form of iron which is found in mineral waters is, with few exceptions, the bicarbonate of the protoxide which is held in solution by the excess of carbonic acid with which the water is charged. It is evidently necessary, therefore, for it to undergo a further process of transformation into lactate or chloride in the stomach before it can be absorbed. Chalybeate waters are for the most part cold, although they may be thermal. They are frequently strongly acidulous, from the presence and large excess of carbonic acid. Upon prolonged

contact with the air, the iron salt gradually undergoes decomposition and separates from the water as hydrated oxide of iron, the free carbonic acid also escaping. It is somewhat difficult to determine at what minimum point a water containing a trace of iron shall cease to be regarded as a chalybeate water. In the case of some of the weakest iron-containing waters it is difficult to distinguish between the restorative and stimulating effects of the improved climatic and hygienic condition of the patients and the actual effects of the water itself. The amount of iron varies, in different springs, from imperceptible traces to as much as 45 grains per gallon.

Iron waters vary greatly also in regard to the additional solid ingredients which they contain. In this respect they may be divided into *simple* and *compound.* Simple chalybeate waters, such as those of Schwalbach in Germany, and of Spa in Belgium, contain little else than the carbonate of iron dissolved in water more or less highly charged with carbonic acid; while the compound iron waters contain varying amounts of the solid constituents which are met with in alkaline, saline, and especially in aperient saline springs.

A few analyses of well-known iron waters will serve as illustrations, as well as for standards to which reference may be made later. See Table VII.

Of the compound iron waters, some are very strong, as those of Radna, which contain 7 grains of iron, and 395 grains in all of solid constituents per gallon. Of the more familiar and popular ones, may be mentioned Pyrmont, with from 4.3 to 5.7 grains of carbonate of iron and about 150 grains of carbonates and sulphates of the alkalies, to Bocklet, with 4.5 grains of carbonate of iron, to 304 grains of solid constituents, including nearly 200 of chloride of sodium, to 55 each of carbonate of lime and sulphate of soda. It is, of course, evident that in the case of these latter waters, the effects would be of a mixed character, and would combine the tonic action of the iron salt with the special action of the other principal ingredients.

CHALYBEATE.

Adirondack Spring, Whitehall, New York. $CaCO_3$ 15, $MgCO_3$ 13, $FeCO_3$ 4, CO_2 54.15 cubic inches. 52° F.

Bedford Alum Springs, Bedford County, Virginia. $FeSO_4$ 23½, $MgSO_4$ 13, $CaSO_4$ 19.

Cave Spring, Bath County, Virginia. $FeCO_3$ 2.

Church Hill Alum Springs, near Richmond, Va. $Fe_2(SO_4)_3$ 135, $FeSO_4$ 24, $MgSO_4$ 86, $CaSO_4$ 89, $Al_2(SO_4)_3$ 73.

Columbia Springs, Columbia County, N. Y. NaCl 84, $CaSO_4$ 65, $MgCl_2$ 31, $CaCl_3$ 22, $FeCl_3$ $3\frac{1}{2}$, H_2S 4.48 cubic inches.

Crab Orchard Acid Spring, Genesee County, New York. H_2SO_4 83, $CaSO_4$ 40, $FeSO_4$ 14.

Cresson Springs, Cambria County, Pennsylvania.

Iron Spring. $FeSO_4$ and $Fe(HCO_3)_2$ 29, $CaSO_4$ 49, $MgSO_4$ 23.

Alum Spring. $FeSO_4$ and $Fe(HCO_3)_2$ 53, $CaSO_4$ 40, $MgSO_4$ 28, and $Al_2(SO_4)_3$ 21 grains.

Geyser Spa Spring, Sonoma County, California. $NaHCO_3$ 23, $Mg(HCO_3)_2$ 10, $FeCO_3$ 4.

Jordan Rockbridge Alum, Rockbridge County, Virginia. $FeSO_4$ $18\frac{1}{2}$.

Kittanning Mineral Spring, Armstrong County, Pennsylvania. $FeSO_4$ $24\frac{1}{2}$, $MgSO_4$ 27, $CaSO_4$ 65.

Linwood Spring, Linwood, Iowa. $FeCO_3$ 27, NaCl 93, $NaHCO_3$ 40, $MgCl_2$ 23.

Napa Soda Spring, Napa County, California. $FeCO_3$ 16, $MgCO_3$ 52. 68° F.

Napa Soda Spring, Napa County, California. $MgCO_3$ 26, $NaHCO_3$ 13, $Fe_2(CO_3)_3$ 8. 68° F.

New Almaden Vichy, Santa Clara County, California. $NaHCO_3$ 201, NaCl 33, $CaSO_4$ and $Ca(HCO_3)_2$ 74, $MgSO_4$ 12, $FeCO_3$ 5, CO_2 238 cubic inches.

New London Alum Springs, Campbell County, Va. $FeSO_4$ $23\frac{1}{2}$, $MgSO_4$ 13, $CaSO_4$ 19.

Ocean Spring, Jackson County, Mississippi. FeO 5, NaCl 48.

Ojo Caliente Spring, Ojo Caliente, New Mexico. Na_2CO_3 115, NaCl 32, $FeCO_3$ 6. 100° F.

Owasso Chalybeate, Owasso, Shiawassee County, Michigan. $FeCO_3$ 12, $MgCO_3$ 11.

Pacific Congress Spring, ten miles S. W. Santa Clara, California. $FeCO_3$ 14, NaCl and Na_2CO_3 242. 50° F.

Pacific Congress Spring, near Santa Clara, California. NaCl 119, Na_2CO_3 123, $FeCO_3$ 14. 50° F.

Ranch Spring, Estes Park, Colorado. $Fe(HCO_3)_2$ 2. 58° F.

Richfield Iron Spring, Otsego County, New York. $CaSO_4$ and $Ca(HCO_3)_2$ 17, $Mg(HCO_3)_2$ 12, FeO 5, CO_2 16. 46° F.

River Spring, Estes Park, Colorado. $Fe(HCO_3)_2$ 4. 58° F.

Rockbridge Alum Spring, Rockbridge County, Virginia. $FeSO_4$ 5, alumina 18. No temp.

Saline Chalybeate Spring, Schuyler County, Illinois. $Fe_2(SO_4)_3$ 70, $CaSO_4$ 74.

Schuyler County Springs, Schuyler County, Illinois. $CaSO_4$ 74, $FeSO_4$ 70.

Sharon Chalybeate Spring, Schoharie County, N. Y. $FeSO_4$ 24, $MgSO_4$ 21. 48° F.

Sparta Artesian Well, Sparta, Monroe County, Wisconsin. $FeCO_3$ 9 grains.

Stryker's Mineral Water, Stryker, Ohio. K_2SO_4 185, $MgCl_2$ 119, NaCl 232, $FeCO_3$ 10.

Tar Spring, Crawford County, Indiana. $FeCO_3$ 4, $CaCO_3$ 21.

Throp's Springs, Hood County, Pennsylvania. $FeCO_3$ 40, $Na_2S_2O_3$ 80, Na_2CO_3 100.

Variety Springs, Augusta County, Virginia. $FeSO_4$ 5, $(NH_4)_2SO_4$ 12, $CaSO_4$ 13.

VIII. *Sulphuretted Waters.*—These are reported to owe their properties to the presence of sulphuretted hydrogen, which is formed by the oxidation of iron pyrites in the presence of water. They also contain in some cases the sulphurets of sodium and potassium. They are either cold or thermal; and in but a few cases are they charged with an excess of carbonic acid. They are, alike with the other classes of mineral waters, used in the form of baths as well as internally.

In many cases the amount of sulphuretted hydrogen and of the sulphurets is so small that it is evident that a large part of the effects which follow the use of such waters is really due to other ingredients, or to the climatic and hygienic conditions attendant.

We have given analyses of some of the best known waters of this class, which will serve the purposes of illustration and reference. See Table VIII.

SULPHURETTED.

Alpena Well, Alpena County, Michigan. $NaCl$ 68, $MgCO_3$ 37, $CaCO_3$ 38, H_2S 35 cubic inches. 52° F.

Auburn Spring, 4 miles west of Auburn, New York. $CaSO_4$ 120, $MgSO_4$ 26, H_2S 12 cubic inches

Avon Lower Spring, Livingston County, New York. $CaCO_3$ and $CaSO_4$ 87, $MgSO_4$ 50, H_2S 10 cubic inches. 45° to 47° F.

Avon Sylvan Spring, Livingston County, New York. $NaCl$ 97, $CaCO_3$ and $CaSO_4$ 107, $MgCl_2$ and $MgCO_3$ and $MgSO_4$ 91, H_2S 20.64 cubic inches.

Avon Upper Spring, Livingston County, New York. $CaSO_4$ 84, Na_2SO_4 and $NaCl$ 34, $MgSO_4$ 10, H_2S 12 cubic inches. 51° F.

Blount Springs, Blount County, Alabama. H_2S 30.67 cubic inches.

Buffalo Lithia Springs, Mecklenburg County, Virginia. $CaSO_4$ and $Ca(HCO_3)_2$ 39, $Li(CO_3)_2$ 2, H_2S 6.68 cubic inches. 60° F.

Calistoga Hot Sulphuretted Spring, at the terminus of the Napa branch of the Pacific Railroad. $NaCl$ 22, H_2S 10 cubic inches. 97° F.

Castilian Spring, Sumner County, Tennessee. 52 cubic inches H_2S.

Chittenango White Sulphur Spring, Madison County, New York. $CaSO_4$ 115, $MgCO_3$ 12, H_2S 12.8 cubic inches, CO_2 18.4 cubic inches. 49° F.

Delaware Sulphur Spring, Delaware County, Ohio. H_2S 96 cubic inches.

French Lick Springs, Orange County, Indiana. $NaCl$ 141, $CaSO_4$ 61, Na_2SO_4 23, $MgSO_4$ 18, H_2S 25½ cubic inches.

Hager's Spring, Hager's County, Tennessee. H_2S 52 cubic inches.

Jordan's White Sulphur, Frederick County, Virginia. H_2S 2 cubic inches. 57° F.

Massena Springs, St. Lawrence County, New York. $NaCl$ 80, $CaSO_4$ 61, $MgCl_2$ 30, H_2S 5 cubic inches.

Orkney Springs, Shenandoah County, Virginia. H_2S 4.88 cubic inches. 59.7° F.

Paroquet Springs, Bullitt County, Kentucky. $NaCl$ 310, $MgCl_2$ 48, H_2S 30 cubic inches.

Rochester or Longmuir's Sulphur Well, Rochester, New York. Na_2SO_4 56, NaCl 52, H_2S 17.26 cubic inches. 52° F.

Salt Sulphur Springs, Monroe County, West Virginia. $CaSO_4$ 68, $CaCO_3$ 33, $MgSO_4$ and Na_2SO_4 44, H_2S 19.12 cubic inches. 65.5° F.

Sharon Gardner Magnesia Spring, Schoharie County, New York. $CaSO_4$ 93½, $MgSO_4$ 20, H_2S 6 cubic inches. 48° F.

Sharon Red Spring, Schoharie County, New York. $CaSO_4$ and $CaCO_3$ 186, $MgSO_4$ 19, H_2S 10.5 cubic inches. 48° F.

Sharon White Sulphur Springs, Schoharie County, New York. $CaSO_4$ 85, $MgSO_4$ 34, $Mg(HCO_3)_2$ 24, H_2S 20.5 cubic inches. 48° F.

St. Helena, White Sulphur, Napa County, California.

No. 2. NaCl 22, H_2S 6.15 cubic inches. 64½° to 97° F.

No. 6. NaCl 23, Na_2SO_4 11, H_2S 4.25 cubic inches. 64½° to 97° F.

UNANALYZED.

Abenquis Springs, Walpole, Cheshire County, New Hampshire.
Alkaline Spring, Yazoo County, Mississippi. 62° F.
Allen's Springs, Lake County, California.
Alum Spring, Lafayette County, Mississippi.
Alum Spring, Lewis County, Kentucky.
Alum Spring, Madison County, Mississippi.
Alum Spring, Marion County, Mississippi.
Alum Spring, Marshall County, Mississippi.
Alum Spring, Pike County, Mississippi.
Amherst Spring, Hillsborough County, New Hampshire.
Anchosa Spring, Anchosa Creek, near Quitman, Mississippi.
Aqua Caliente, or Warner's Ranch Springs, San Diego County, California.
Aqua, or Ojo Caliente, near Ojo Caliente, New Mexico. 130° F.
Armstrong Spring, eight miles west of Searcy, Arkansas.
Bailey Springs, Lauderdale County, Alabama. 72° to 80° F.
Bartlett Springs, Lake County, California.
Bath Chalybeate Spring, Bristol, Pennsylvania.
Bear River Hot Springs, near Bear River, Utah. 134° F.
Bedford Spring, Trimble County, Kentucky.
Beersheba Springs, Grundy County, Tennessee.
Belle Cheney Springs, Calcasieu Parish, Louisiana.
Berkshire Soda Springs, near Great Barrington, Massachusetts.
Big Bone Springs, Boone County, Kentucky.
Big Lick, Gallatin County, Kentucky.
Black Sulphur Springs in Alabama.
Black Sulphur Springs, Van Buren County, Arkansas.
Blossburg Spring, Tioga County, Pennsylvania.
Blue Spring, near New Amsterdam, Harrison County, Indiana.
Bogards Spring, Bogards Valley, Indiana.
Box Mountain Sulphur, west of Todd's Gap, Kentucky. 63° F.
Bradford Spring, Merrimac County, New Hampshire.
Brandywine Spring, Claiborne County, Mississippi.
Brunswick Springs, Brunswick, Essex County, Vermont.
Buenoventer Springs, Kentucky.
Burdell's Well, Caldwell County, Texas.

Burner's or Seven Springs, Shenandoah County, Virginia.
Burning Spring, Washington County, Alabama.
Byron Acid Spring, Genesee County, New York.
Cabello Springs, five and a half miles from Fort McRae, New Mexico. 136° F.
Catalytic Springs, one-half mile from Catalytic, Georgia.
Caledonia Spring, Franklin County, Pennsylvania.
Campbellsville Sulphur Water.
Campo Chalybeate Spring, California.
Canon Creek Springs, Colorado. Temperature, 136° to 158° F.
Carlisle Springs, Cumberland County, Pennsylvania.
Carroll White Sulphur Springs, Alleghany County, Maryland. 48° F.
Cascado Spring, Michigan.
Castilian Springs, Holmer County, Mississippi.
Castle Rock Spring, near base of Mt. Shasta, California.
Cayner's Sulphur Springs, Botetourt County, Virginia.
Cemlian Springs, Kentucky.
Chameleon Springs, Edmonson County, Kentucky.
Chalybeate Springs, in Van Buren County, Arkansas.
Chalybeate Spring, Rochester, Fulton County, Indiana.
Chalybeate and Saline Springs are found in Putnam, Warren, Jackson, Clarke, Floyd, and Scott Counties, Indiana.
Chalybeate Springs south of Williamsport, Indiana.
Chalybeate Spring at Leecher's Court House, Kentucky.
Chalybeate Springs abundant in Perry County, Kentucky.
Chalybeate Springs in Pulaski County, Kentucky.
Chalybeate Springs, several on Rockcastle River, Kentucky.
Chalybeate Spring, Webster County, Kentucky.
Chalybeate Springs, Whitley County, Kentucky.
Chalybeate Springs, Clark County, Mississippi.
Chalybeate Spring near Enterprise, Mississippi. 64.4° F.
Chalybeate Springs, Itawamba County, Mississippi.
Chalybeate Spring, near Warren's Mill, on Mackay's Creek, Mississippi.
Chalybeate Spring, Winston County, Mississippi.
Chalybeate Spring, Yallabusha County, Mississippi. 75.2° F.
Chalybeate Spring in Amherst, New Hampshire.
Chalybeate Spring, four miles from Pittsburg, Pennsylvania. Temperature, 54° F.
Chappaqua Spring, Rensselaer County, New York.
Cheltenham Spring, St. Louis County, Missouri.
Chick's Springs, Greenville District, South Carolina.
Choteau Spring, Cooper County, Missouri.
Crystal Spring, Napa County, California.
Clear Creek Sulphur Spring, Kentucky.
Cold Sulphur Springs, Rockbridge County, Virginia.
Coleman's Well, Jackson County, Mississippi.
Columbia Springs, Marion County, Mississippi.
Corydon Artesian Well, Harrison County, Indiana.
Corydon Saline Sulphur Well, half a mile east of Corydon, Harrison County, Indiana.
Cotton Wood Hot Springs, ninety miles west of Colorado Springs, Colorado.
Crittenden Springs, Crittenden County, Kentucky.

Cullenn's Springs, one mile southwest of Bladen Springs, Alabama.
Curdwell's Springs, Caldwell County, Texas.
Daggar's Spring, Botetourt County, Virginia.
Da Gonia Springs, Warwick County, Indiana.
De Sota Spring, De Sota Parish, Louisiana.
Doubling Gap Springs, Cumberland County, Pennsylvania.
Drennon Spring, Henry County, Kentucky.
Dryden Springs, Tompkins County, New York.
Eggleton's Springs, Giles County, Virginia.
Elk Spring, Pike County, Missouri.
Elkmont Springs, Giles County, Tennessee. 58° F.
Elko Warm Spring, Idaho.
Elgin Springs, Addison County, Vermont.
Ephrata Spring, Lancaster County, Pennsylvania.
Epsom Spring, Trimble County, Kentucky.
Esculapia Springs, Lewis County, Kentucky.
Excelsior Spring, Syracuse, New York.
Fauquier White Sulphur Springs, Fauquier County, Virginia.
Fergusen's Chalybeate Spring, on southwest quarter of section 21, township 11, range 6.
Flint's Springs, St. Joseph County, Michigan.
Fox Spring, Fleming County, Kentucky.
Frankfort Springs, Beaver County, Pennsylvania.
Franklin Spring, at head of Well's Creek, Mississippi. 64° F.
Garnet Springs, near Toccoa Falls, Georgia.
Garrett Spring, one and a half mile from Spartanburg, South Carolina.
Genoa Hot Springs, Washoe County, Nevada.
Gerons Spring, in Northern Alabama.
Geyser Springs, Sonoria County, California.
Gower's Spring, Gainesville, Georgia.
Grand Ledge Spring, Eaton County, Michigan.
Grayson Springs, Grayson County, Kentucky.
Grayson Sulphur Springs, Carroll County, Virginia.
Green's Spring, Jefferson County, Illinois.
Greenwood Spring, Monroe County, Mississippi.
R. B. Grigsby's White Sulphur Mineral Water, Nelson County, Kentucky.
Harbon Springs, twenty miles from Calistoga, California.
Hardinsville Sulphur Spring, Franklin County, Kentucky.
Healing Springs, Washington County, Alabama.
Heartsell's Hot Sulphur Spring, South Park, Colorado.
Hine's Hot Springs, Lyon's County, Nevada.
Hopkinton Springs, Middlesex County, Massachusetts.
Hot Springs, near Boise City, Idaho. 196° F.
Hot Springs, near Idaho City, Idaho.
Hot Springs, near Pyramid Lake, Nevada. 208° F.
Hot Spring, near Utah Central Railroad, Utah. 175° F.
Hot Sulphuretted Spring, on Gila River, Arizona.
Howard's Springs, California.
Howell Mineral Water, Hardin County, Kentucky.
Huguenot Springs, Powhatan County, Virginia.
Iron Lake Spring, near Silverton Pass, Colorado.

Irvin Sulphur Springs, Kentucky.
Jackson Springs, Clarke County, Alabama.
Jemez Spring, in San Diego Cañon, fifty miles west of Santa Fe, New Mexico. 140° F.
Johnson's Wells, near Meridianville, Alabama.
Jones White Sulphur and Chalybeate Springs, eleven miles from Warrenton, North Carolina.
Kellum Sulphur, Grimes County, Texas.
Kirk Spring, Lewis County, Kentucky.
Kittrel's Springs, Granville County, North Carolina.
Knightstown Spring, Henry County, Indiana.
Lake Tahoe Hot Springs, on border of Lake Tahoe, California.
Lauderdale Spring, Mississippi.
Lane's Spring, Stonis Caus County,(?) California.
Lava Springs in Grand Cañon of Colorado, Arizona.
Lee's Springs, twenty miles northeast from Knoxville, Tennessee.
Limestone Springs, twenty-one miles from Spartansburg, South Carolina.
Little Geyser Springs, Lononia County, California.
Liverpool Well, New York.
Los Vegas Springs, Los Vegas, New Mexico.
Lower Soda Springs, Linn County, Oregon.
Low's Well, Ballston, Saratoga County, New York.
Lunenburg Spring, Lunenburg, Essex County, Vermont.
Magnesia Spring, Tallulah Falls, Georgia.
Malhuer River Springs, Baker County, Oregon. 193° F.
Mammoth Spring, Fulton County, Arkansas. 60° F.
Mammoth Well, Nelson County, Kentucky.
Mana Squan Spring, Point Pleasant, Ocean County, New Jersey.
Many Hot and Cold Springs in Animas Valley, Colorado.
Massie's or Red Sulphur Spring, Chillicothe, Georgia. 54.5° F.
Mershon or White Sulphur Spring, Georgia. 55° F.
Middleton Springs, Middleton, Rutland County, Vermont.
Miller's Mineral Spring, Knox County, Kentucky.
Mineral Springs in Toccoa, Georgia.
Mineral Springs, ten in number, at Waha, Idaho.
Mineral Springs, Pike County, Illinois.
Mineral Springs, Washington County, Illinois.
Mineral Springs at Cowpens Furnace, near Pacolet, South Carolina.
Mineral Springs at the base of Henry's Knob, South Carolina.
Mineral Spring near Parson's Mountains, Abbeville, South Carolina.
Mineral Spring on the Soluda, near Pinson's Ford, South Carolina.
Mineral Springs near Bingham City, Utah.
Mineral Water, two miles from Dowlingsville, Grant County, Kentucky.
Mississippi Springs, Hinds County, Mississippi.
Missisquoi Springs, viz.: Central, Missisquoi, Vermont, and Sheldon are in Franklin County, Vermont.
Monagaw Sulphuretted Springs, St. Clair County, Missouri.
Monroe Hot Springs, Castle Creek, sixty miles south of Prescott, Arizona. 150° F.
Montgomery White Sulphur Springs, Montgomery County, Virginia.
Morrison Springs, Morrison, twelve miles from Denver, Colorado.

Mt. Clemens Spring, Macombe County, Michigan.
Mountain Valley Springs, ten miles north of Hot Springs, Arkansas.
Oliver Springs, Daviess County, Kentucky.
Oliver Springs, Anderson County, Tennessee.
Ouray Mineral Springs, Ouray, Colorado. Temperature, 120° to 134° F.
Ouray Mineral Spring in Uncomphagre Park, Colorado. 120° to 140° F.
Ouray Spring, Uncomphagre Park, 9 miles northwest of Ouray, Colorado. Temperature, 140° F.
Parkersburg Mineral Wells, Wood County, Virginia.
Pearson Springs, California.
Perry County Springs, 11 miles from Carlisle, Pennsylvania. 72° F.
Piedmont Sulphur Springs, 10 miles north-northeast of Navasota, Texas.
Platte Springs, near Fort Steele, Wyoming. 115° F.
Pulaski Alum Springs, Pulaski County, Virginia.
Puncha Springs, 60 miles west of Cañon City, Colorado. 120° F.
Quitman Red Sulphur, near Quitman, Missouri.
Reed's Mineral Spring, Washington County, New York.
Reuben Jesse's Mineral Water, Woodford County, Kentucky.
Rinnah Wells Spring, Adalusia, Rock Island County, Illinois.
Roanoke Red Sulphur Springs, Roanoke County, Virginia.
Robinson's Spring, 20 miles from Nashville, Tennessee.
Rob's Chalybeate Spring, McCracken County, Kentucky.
Rochester Spring, 12 miles from Harrodville, Boyle County, Kentucky.
Rockbridge Baths, Rockbridge County, Virginia.
Roper's Wells, Butler County, Alabama.
Russell Chalybeate Spring, Kentucky.
Russell Sulphur Spring, Kentucky.
Saline Chalybeate, Colfax, Jasper County, Iowa.
Salt Springs at Geddes, New York.
Salt Springs, Lincoln, Nebraska.
San Bernardino Hot Springs, San Bernardino County, California.
Schooley's Mountain Spring, Morris County, New Jersey. 50° F.
Searcy Springs, White County, Arkansas.
Sebra Springs, Kentucky.
Seigler Springs, Lake County, California.
Shannondale Springs, Jefferson County, Virginia.
Shenandoah Alum Springs, Shenandoah County, Virginia.
Shelby Springs, Shelby County, Alabama.
Shocco Springs, Warren County, North Carolina.
Skaggs Springs, California.
Social Hill Mineral Water, Kentucky.
South Arkansas Mineral or Poncho Hot Springs, Lake County, Colorado. 120° F.
Steamboat Springs, 10 miles from Carson City, Washoe County, Nevada.
Stone Spring, Lincoln County, Kentucky.
Stoveall's Spring, Marion County, Mississippi.
Sudduth or Mud Spring, Kentucky.
Sulphuretted Chalybeate Spring, half mile northeast of Pittsfield, New Hampshire.
Sulphuretted Springs are found in Jasper, Lawrence, and Pike Counties, Indiana.

Sulphur Spring, Tallulah Falls, Georgia.
Sulphur Spring, 1½ miles east of Zoar, Georgia.
Sulphur Spring, southwest centre of section 15, Illinois.
Sulphur Spring, Allen County, Kansas.
Sulphur Spring, Union County, Kentucky.
Sulphur Spring, in Calcasieu Parish, Louisiana.
Sulphur Spring, near Covington, Louisiana.
Sulphur Spring, near Enterprise, Mississippi.
Sulphur Springs, St. Clair County, Alabama.
Sulphur Springs, near Philadelphia, Mississippi.
Swayne's Mammoth Springs, Henry County, Tennessee.
Sweeney's Chalybeate Spring, Kentucky.
Syracuse Salt Well, Syracuse, New York.
Talladegg Spring, Talladegg County, Alabama.
Tea Spring, Bath County, Kentucky.
Thermal Spring, near Fort Laramie, Nebraska. 74° F.
Thermal Springs in Arizona.
Tipton Well, Jackson County, Mississippi.
Trinity Springs, Martin County, Indiana. 57° F.
Tuscan or Lick Springs, near Red Bluff, Tehama County, California.
Unity Springs, Newport, Sullivan County, New Hampshire.
Valhermosa Springs, 18 miles from Huntsville, Alabama.
Victor Spring, Genesee County, New York.
Volcano Springs, Lander County, Nevada.
Warm Springs, eleven miles from Ogden City, Utah. 129° F.
White Sulphur Spring of San Juan Capitraus, forty miles north of San Diego, California.
Warm Sulphur Springs, Elko, Elko County, Nevada.
Warren White Sulphur Springs, Warren County, North Carolina.
Washington Bell's Sulphur Water, Marion County, Kentucky.
Weldon Spring, St. Alban's, Franklin County, Vermont.
Western Saratoga, Union County, Illinois.
White Sulphur Mineral Water, Marion County, Kentucky.
White Sulphur, six miles east of Gower Springs, Georgia.
White Sulphur Spring, Catawba County, North Carolina.
White Sulphur Spring, Neshoba County, Mississippi.
White Sulphur Springs, Breckenridge County, Kentucky.
White Sulphur Springs, Greene County, New York.
White Sulphur Springs, Ohio County, Kentucky.
White Sulphur Wells, Metcalf County, Kentucky.
Wilbur Springs, near Colusa, California.
Williamstown Springs, Anderson County, South Carolina.
Wilson's Springs, Spartanburg District, South Carolina.
Winchester Springs, Franklin County, Tennessee.
Wooley's Springs, Limestone County, Alabama.
Wyandotte Spring, Wayne County, Michigan.
Yates Mineral Spring, Boyle County, Kentucky.
Yellow Spring, Chester County, Pennsylvania.
Yelvington Spring, Daviess County, Kentucky.
York Springs, Adams County, Pennsylvania.

TABLE I.

ST. LAWRENCE RIVER WATER. (Analyst, T. Sterry Hunt.)

One U. S. gallon (231 cubic inches) contains—

Carbonate of soda	0.056	grain.
Carbonate of magnesia	0.208	"
Carbonate of lime	0.672	"
Chloride of potassium	0.016	"
Chloride of sodium	0.024	"
Sulphate of soda	0.144	"
Silica	0.304	"
Oxide of iron and manganese	trace	
Alumina phosphoric acid	trace	
	1.424	

CRITCHMERE, SCHUYLKILL, CROTON, AND SWEET SPRING WATERS.

Critchmere Springs, Surrey, England.

One U. S. gallon (231 cubic inches) contains—

Calcium	0.26	grain
Magnesia	trace	
Sodium	0.29	"
Carbonic acid	trace	
Sulphuric acid	0.64	"
Chlorine	0.54	"
Silicic acid	0.83	"
Organic matter	0.76	"
Potassium	0.13	"
Nitric acid	trace	
	3.45	

Schuylkill River Water, Philadelphia, Penna. (Analyst, L. Sullivan, Jr.)

One U. S. gallon (231 cubic inches) contains—

Carbonate of magnesia	0.352	grain
Carbonate of lime	1.872	"
Chloride of sodium	0.144	"
Chloride of magnesium	0.008	"
Sulphate of magnesia	0.056	"
Silica	0.080	"
Salts of soda with nitric and organic acid	1.648	"
	4.160	

Croton Water, *New York City*, *New York*. (Analyst, Prof. Chandler.)

One U. S. gallon (231 cubic inches) contains—

Chloride of sodium	0.284	grain
Sulphate of potash	0.205	"
Sulphate of soda	0.024	"
Sulphate of lime	0.024	"
Carbonate of lime	1.698	"
Carbonate of magnesia	0.935	"
Alumina and oxide of iron	0.058	"
Silica	0.222	"
Organic and volatile matter	0.874	"
	4.324	

Sweet Spring, *Bedford*, *Penna*. (Analyst, F. A. Genth.)

One U. S. gallon (231 cubic inches) contains—

Carbonate of calcium	0.522	grain
Carbonate of magnesia	0.135	"
Silicic acid	0.654	"
	1.311	

Free carbonic acid, .66 cubic inch. Temperature, 52.7° F.

TABLE II.

CLYSMIC NATURAL SPRING WATER, WAUKESHA, WISCONSIN.
(Analyst, Rathbene.)

One U. S. gallon (231 cubic inches) contains—

Chloride of sodium	1.170	grains
Sulphate of potassa	0.456	"
Sulphate of soda	0.560	"
Bicarbonate of lime	16.044	"
Bicarbonate of magnesia	13.563	"
Bicarbonate of iron	0.038	"
Bicarbonate of soda	1.261	"
Phosphate of soda	0.032	"
Silica	0.722	"
Organic matter	1.616	"
Alumina	trace	
Carbonic acid (?)	35.462	

SELTERS OR SELTZER SPRING, GERMANY. (Analyst, Bischoff.)

One U. S. gallon (231 cubic inches) contains—

Chloride of sodium	123.86	grains
Sulphate of soda	1.86	"
Carbonate of soda	44.5	"
Carbonate of lime	14.19	"
Carbonate of magnesia	14.19	"
Oxide of iron	0.81	"
Silicic acid	1.46	"
Salt of potassa	1.1	"
	201.85	

Carbonic acid, 240 cubic inches.

APOLLINARIS SPRING, NEUENAHR, RHENISH PRUSSIA. (Analyst, Mohr.)

One U. S. gallon (231 cubic inches) contains—

Chloride of sodium	20.79	grains
Sulphate of soda	12.2	"
Carbonate of soda	55.07	"
Carbonate of lime	14.6	"
Carbonate of magnesia	23.93	"
Oxide of iron	0.22	"
Silicic acid	1.08	"
	127.89	

Carbonic acid, 376 cubic inches.

TABLE III.

WIESBADEN, THE KOCHBRUNNEN, NASSAU, GERMANY.

156° F. One U. S. gallon contains—

Chloride of sodium	419.92	grains
Chloride of potassium	8.96	"
Chloride of lithium	0.08	"
Chloride of calcium	28.88	"
Chloride of magnesium	12.48	"
Bromide of magnesium	0.16	"
Sulphate of lime	5.52	"
Carbonate of lime	25.68	"
Carbonate of protoxide of iron	0.32	"
	502.00	

Carbonic acid, 52 cubic inches.

TABLE IV.

SPRUDEL SPRING, CARLSBAD, GERMANY.

One U. S. gallon (231 cubic inches) contains—

Sulphate of potash	9.54	grains
Sulphate of soda	138.44	"
Chloride of sodium	53.16	"
Carbonate of soda	79.49	"
Carbonate of lime	17.38	"
Carbonate of magnesia	7.23	"
Carbonate of strontia	0.04	"
Alumina and peroxide of iron	0.16	"
Silica	4.24	"
Trace of various salts	2.78	"
	314.46	

Amount of carbonic acid set free entirely or in part, 44.58 grains.

OFNER RAKOZY, HUNYADY JANOS, AND FRIEDRICHSHALL WATERS.

One U. S. gallon (231 cubic inches) contains—

	Ofner Rakozy Spring. Analyst, Dr. Chas. R. T. Tichborn. Grains.	Hunyady Janos. Analyst, Knapp. Grains.	Friedrichshall Spring. Analyst, Baron V. Liebig. Grains.
Sulphate of magnesia	1462.161	935.276	300.238
Sulphate of soda	1216.356	929.378	353.612
Sulphate of lime	389.878		78.490
Sulphate of lithia	12.089		
Sulphate of potassa	3.913	4.906	11.563
Sulphate of ammonium	0.409		
Carbonate of soda	25.346	46.486	
Carbonate of lime	40.880	54.488	0.818
Carbonate of iron	3.148		30.369
Carbonate of magnesia			464.630
Alumina and oxide of iron		0.245	traces
Alumina	1.577		
Chloride of sodium	135.138	76.212	
Chloride of magnesium			230.038
Silica	3.013	0.064	traces
Bromide of sodium	0.408		
Bromide of magnesium			0.642
Free and partly combined carbonic acid		30.485	
Fluorine	trace		
Total	3294.316	2077.540	1470.400

TABLE V.

GRANDE GRILLE AND HOPITAL SPRINGS. Analyst, Mossièr.

One U. S. gallon (231 cubic inches) contains—

	Grande-Grille. Grains.	Hopital. Grains.
Carbonate of soda	259.03	254.75
Carbonate of lime	12.23	18.62
Carbonate of magnesia	2.28	2.05
Carbonate of iron	0.60	2.73
Chloride of sodium	23.94	8.36
Sulphate of soda	42.33	47.65
	340.44	334.16

TABLE VI.

HELENQUELLE SPRING AT WILDUNGEN, GERMANY. Celebrated Calcareous Water.

One U. S. gallon (231 cubic inches) contains—

Sulphate of soda and potash	5.31	grains
Sulphate of magnesia	17.97	"
Sulphate of lime	81.11	"
Bicarbonate of iron	0.60	"
	104.99	

Free carbonic acid, .912 cubic inch. Temperature, 122° F.

LORENZ SPRING AT LEUKÈRBAD, LOÈCHE-LES-BAINS. Sulphate of Lime Water.

One U. S. gallon (231 cubic inches) contains—

Sulphate of soda and potash	2.43	grains
Bicarbonate of lime	74 12	"
Bicarbonate of magnesia	79.60	"
Bicarbonate of iron	1.08	"
Bicarbonate of soda	49.35	"
Chloride of sodium	60.92	"
Silica	1.80	"
	269.30	

Free carbonic acid, 258 cubic inches. Temperature, 52° F.

TABLE VII.

SIMPLE IRON WATERS, SPA, IN BELGIUM. Pouhar Spring. Temperature, 50°.

One U. S. gallon (231 cubic inches) contains—

Carbonate of iron	6.61	grains
Carbonate of soda	6.84	"
Carbonate of magnesia	2.35	"
Carbonate of lime	5.70	"
Carbonate of alumina	0.26	"
Chloride of sodium	1.52	"
Silica	2.13	"
Total solid constituents	25.41	"

Carbonic acid, 159 cubic inches.

It must be added that Struve's analysis gives only 2.8 grains of carbonate of iron, and 60 cubic inches of carbonic acid per gallon. But the analysis above given probably represents the actual characters of the Spa water.

SCHWALBACH IN GERMANY. Various springs. Temperature, 47° to 50°.

One U. S. gallon (231 cubic inches) contains—

Carbonate of iron	3.4 to 6.8	grains
Carbonate of soda	1. to 14.	"
Carbonate of magnesia	6.8 to 33.	"
Carbonate of lime	11. to 33.	"
Chloride of sodium	0.2 to 2.5	"
Total solid constituents	22 to 89	grains

Carbonic acid, 195 to 381 cubic inches.

TABLE VIII.

Aix-la Chapelle, Eilsen, and Toplitz Warasdin Waters.

One U. S. gallon (231 cubic inches) contains—

	Aix-la-Chapelle. 131° F. Grains.	Eilsen. 54.5° F. Grains.	Toplitz Warasdin. 136° F. Grains.
Chloride of sodium	162.160		7.464
Sulphuret of sodium	0.576		
Sulphate of soda	17.368		18.048
Sulphate of potash	9.488		
Sulphate of lime		77.648	10.816
Carbonate of soda	39.960		
Carbonate of magnesia	3.160	11.248	6.632
Carbonate of lime	9.736		21.744
Carbonate of oxide of iron	0.584	3.128	1.104
Silicic earth	4.056		10.016
Silicate of soda		8.664	
	247.088	100.688	75.824
	Cubic inches.	Cubic inches.	Cubic inches.
Sulphuretted hydrogen	4.00(?)	12.08	52.24
Carbonic acid	?	11.52	24.00

Respectfully submitted by your Committee,

WILLIAM PEPPER, *Reporter.*
HENRY I. BOWDITCH.
A. N. BELL.
STANFORD E. CHAILLÉ.
CHARLES DENISON.

HUMANE SOCIETIES.

By WILLIAM F. THOMS, M.D.,
NEW YORK.

THE saving of human life is a sacred mission, in which the medical profession has always taken a deep interest, and its distinguished members a leading part. The histories of the organization of societies of this character are of great interest, showing the progress of medical science in this department of practical benevolence.

About the year 1767 a humane society was established in Amsterdam, and almost simultaneously in other parts of Europe. The memoirs of the Dutch society were translated into English in 1773; this led to the formation of the Royal Society in England. The American Humane Society was organized about the year 1850. Similar organizations exist in China, Japan, and the East Indies.

The original intention of these humane societies was simply the saving of the apparently drowned; but the American Humane Society has enlarged its sphere of action, and includes in its trust all the means of life-saving now known to the profession. The American Medical Association has already awarded two of its first prizes to its members for essays on this subject.

Resuscitation of the Apparently Drowned.—This art does not appear to have been known to the ancients. Some instances of the recovery from drowning and hanging mentioned in a note to Durham's Physico-Theology are the first on record. These cases happened at Fronningholm and at Oxford about the year 1650, and the means used were similar to those employed at the present day. It does not seem, however, that these instances excited any public interest, or that any serious investigation of the subject of suspended animation took place till about the middle of the last century. At that period the penetrating genius of Dr. J. Fothergill, which had in other branches of the

profession developed new and important modes of treating disease, led him to perceive the fallacy and dubiousness of the received criteria of dissolution, and in a paper which he addressed to the Royal Society of England, he mentioned, as the result of his inquiries, the possibility of saving many lives without risking anything. To us it must appear extraordinary that this publication exerted but little interest and attention among the medical philosophers of his times. He had, however, propounded a most important theory, although the glory of putting it to the test of experiment was reserved for a later period. This was first attempted by M. Recamier, who made several attempts at resuscitation in Switzerland in the year 1767, transmitting reports of his cases to the Academy of Sciences in Paris. Dr. Coogan, in 1773, called the attention of the people of England to the practicability of resuscitating the apparently drowned; and the ardent and indefatigable Dr. Haws found that a strong and general prejudice existed against the practicability of attempting resuscitation, and the idea was even ridiculed as hopeless and chimerical; he, however, determined to demonstrate it. With this view he publicly offered rewards to persons who should within a certain period from the occurrence of an accident rescue the bodies of drowned persons and bring them to places on shore for their reception, in order that the means of resuscitation might be tried. At these places he and his friends restored several lives.

There are no less than six different methods of restoring the drowned. Dr. Marshall Hall's method of resuscitation is simply the turning of the body from its face to its sides, repeated fifteen times a minute. Dr. Sylvester's method consists in drawing the arms up and forcing them down over the chest. The method of Dr. Benjamin Howard (who received a prize of one hundred dollars from the American Medical Association) is compression and relaxation of the diaphragm by pressure over the region of the epigastrium. The American method, which has been approved by Dr. Thoms, President of the American Humane Society, consists in lifting the patient by the collar of the coat at the back of the neck, counting one, two, three, then pressing firmly over the lower ribs at the back of the patient, counting one, two—repeating this movement fifteen times a minute for at least two hours or longer.

Saving of Life and the Prevention of Drowning and Death.—The American Humane Society has organized a Life Guard Association for the purpose of preventing drowning at our watering-places. The members of the Association are instructed in all the methods of life-saving at the Life-Saving Training School under the auspices of the Society. During the winter months they are employed in the life-saving service all along the coasts of the United States.

The prevention of drowning and disaster at sea is an important part of the work of this Society, and a Nautical School for the education of young seamen has been in active operation for the past thirty years, educating over 7500 in nautical science and life-saving. Practical works on navigation and nautical astronomy have been specially prepared to simplify and make practical all the scientific truths which have been discovered, thus saving thousands of lives and millions of property.

The saving of life, by the prevention of disease on shipboard and on shore, is an important part of the work of the American Humane Society. With this object in view a number of works have been published, and institutions have been created by the Society, one of which, "An Essay on Health in Country and Cities," received the first prize from the American Medical Association at its session in Baltimore in 1866. A large number of life-charts have been constructed, showing how lives are destroyed by physical influences so well known to medical men. One of them has been published by the American Medical Association in its Transactions. It shows the effects of impure air and overcrowding on health. Sanitary surveys have been made by the Society in order to discover the best methods of saving life. A new system of ventilation has been introduced which cools or warms the air at pleasure, and at the same time keeps the air always pure. Floating hospitals, sea-side sanitariums, fresh air funds, children's excursions, gospel barges for Sunday services during the heated term, night medical services, and many other practical methods of life-saving have been established. Health colleges have been organized for the instruction of seamen and others in the simple method of treating cases of emergency, and maintaining a physiological condition of health and a sanitary supervision over their surroundings on sea and shore, thus preventing diseases of all kinds and saving many valuable lives.

This Society is now establishing a humane system of arbitration for the protection of all classes of the community. It expects to have a commission appointed by Congress to prevent the destructive effects of strikes upon life and property by arbitrating between the parties interested. It is also educating the public mind up to the necessity of having the streets, gutters, and sewers thoroughly washed by using a large quantity of water, and is endeavoring to have the social evil placed under strict sanitary control and supervision without any legal endorsement of the evil in any way, thus maintaining the high moral tone of the American community.

It will be thus observed that the fields occupied by humane societies are very extensive; and the members of the medical profession have it in their power to advance the cause of practical benevolence, in every city, town, village, or country where their lot may be cast, by simply calling to their aid an advisory committee of prominent citizens, who will be the means of obtaining sufficient funds to carry out these beneficent objects, and thus enable the profession to take a leading part in every work of charity. They will, at the same time, have the position in society and the world which rightfully belongs to them as the only correct interpreters of the laws of life-saving, health, morality, and scientific humanitarian efforts.

Hoping that the members of this Association may take an active part in the organization of humane societies in the parts of the country where they reside, thus making life safer and at the same time promoting the health, social enjoyment, and happiness of all under their influence, is the earnest wish of one who has devoted his life to the welfare of his fellow-man.

THOUGHTS REGARDING ALMSHOUSES.

By W. H. LATHROP, M.D.,

TEWKSBURY, MASS.

In the following paper I desire to present a few thoughts which have impressed me as important in their relation to the poor.

In what I have to say I will confine myself principally to the organization and construction of new institutions. It is very often the case that persons are called upon to build almshouses who have had no experience in this direction, and for this reason it is well to present thoughts bearing upon the subject. A great obstacle to improvement is an impression which is very prevalent that anything in the shape of a building will do for an almshouse, and that there are no special principles of construction bearing upon such a case.

In the first place, it is generally conceded that an almshouse must be cheap. It should be so, and so should insane asylums, and all charitable institutions—as cheap as is consistent with the object proposed. The plan I suggest is not in any sense inconsistent with cheapness, and the point upon which I would most earnestly insist is that it costs no more to build conveniently and properly than otherwise.

Such institutions are usually and very properly located upon farms where land is plenty and cheap. The soil, I think, should be light, rather inclined to be sandy. Such land is very easily worked by the debilitated persons who are employed upon it, and, moreover, it is absorbent. No standing pools vitiate the air, while it is easy to make the abundant sewage drain off into the soil. The unproductiveness of such soil, which usually makes it unmarketable, would not be an objection for this use, since the sewage will furnish a great abundance of manure, and it is very important from a sanitary standpoint that the sewage should be thus applied, as it prevents the contamination of streams and the accumulation of stagnant cesspools.

It is far better that the land should be sloping than level, since the drainage is thus made easy and efficient. If the land slopes on both sides of the institution, the facilities are more perfect, and there is less danger of an accumulation at any one point.

The character of the buildings to be erected is a more intricate and important question to decide. I will not undertake to present exact plans of a building, as if intended for immediate use, for, as physicians, you would not be interested in such details, and furthermore, I design merely to discuss a few of the principles which should govern the erection of such buildings, and be applicable alike to a home for fifty or for a thousand inmates.

A New York architect was recently called upon by one of my friends to make plans for a house; and he said, "Tell me what rooms you want, and I will build the house around them." Now, there are very many architects who are not so sensible as this one. They first make an outside plan, and afterwards try to accommodate the inside to it. They endeavor to make about the same display, whether they build an almshouse, a hotel, or a State capitol.

Overseers of the poor are sometimes afflicted with the same kind of pride. They want to leave a monument of the greatness of their administration. Some gentlemen of this kind once asked the superintendent of an almshouse how they should build. He told them to provide for their inmates as near the ground as they could. They built a four-story building, but within a year wished it had been one story.

It should be borne in mind that we are building for the poor. This thought should be foremost at all times. It is to be a home and refuge for the aged, the blind, the lame, paralytics, epileptics, pregnant women awaiting confinement and young mothers with children, for children of various ages, for the consumptive; and, in general, for the sick, the feeble, and the convalescent. To all of these, low buildings are desirable. They abhor stairs. It is therefore important that, however the architectural beauty of the group of buildings may be affected, they should be built for the comfort of the occupants, and not more than one or two stories in height in the portions occupied by inmates.

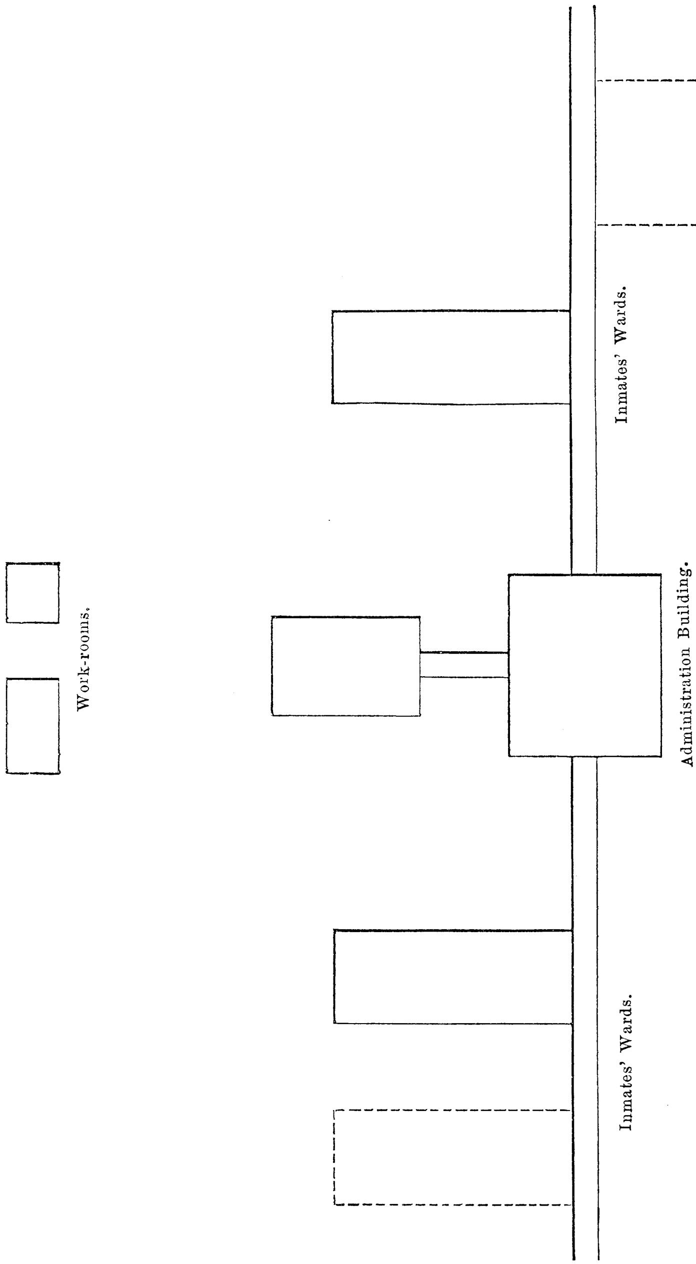
But to return to the general plan: I would first separate the

farm buildings, as is usually done in large institutions, and have them approached by a separate drive. I would also provide quarters near them for a few who have the immediate care of the work there.

The other buildings may be divided into three classes: the administration building, which includes the residence of the Superintendent; the dormitories of the inmates; and the work-rooms. The first may be in the centre, the last-named in the rear, and the dormitories on either side. This, it will be perceived, is an arrangement very common in insane asylums of large dimensions. The principle which I wish to refer to in this connection is that of *flexibility*. The buildings should be so arranged that enlargement may occur in any one of the three groups without disturbing the general working of the institution. The history of such places is that from time to time they need additions. If the original plan does not contemplate this contingency, disorganization is often produced in making the change. The buildings are put up with reference only to the absolute need of the present, and when additions are required the new buildings must be put in unsuitable places, or old ones must be moved or pulled down. With every new building there is a change of plan, with a proportionate increase of cost. Moreover, it is very often the case that buildings are too near together. Plans which would apply to city lots are adopted on a country farm.

The general plan which I suggest is that of an inverted ⊥. In the centre we have our administration building, and going out on either side, corridors or covered walks from which the wards may radiate directly backward, or backward and forward alternately, if preferred. In the rear of the central building the work-rooms may be placed, including the kitchens, bakery, laundry, carpenter and blacksmith shops, ice-house, stable, and dead-house. If now we were to build for fifty inmates, we might put up one ward for each sex, with buildings in the rear so placed as to leave room for more. The plan is flexible; it can be originally used for an institution for fifty inmates, and gradually enlarged to provide for a thousand. It is not drawn out in details, because these will depend upon the position occupied and the taste of the builders. This general plan may be varied greatly in form without changing the principle of flexibility. By such an arrangement are secured the separation of the sexes,

Fig. 1.


Inmates' Wards.
Work-rooms.
Administration Building.
Inmates' Wards.

and the easy passage of the inmates from one building to another without exposure to cold or rain; and it places the office and home of the Superintendent where he can the most easily control those under his charge.

Moreover, it is easy to have in connection with each ward an exercise-ground for the patient's own exclusive use, to which they can go and come without great effort; also, while they are in the yard they can be observed by the person having immediate charge of them.

If the buildings are only one-story in height, this arrangement is very pleasant for the aged and feeble, especially in summer, enabling them easily to go out of doors.

With regard to matters connected with the general management of such institutions, permit me to add a few suggestions.

Provision for insane persons is often overlooked, or extremely inadequate. But it will be said an almshouse is no place for an insane person, and no such should be there. This is true theoretically; but, as a matter of fact, there will almost invariably be some insane in every almshouse, no matter what means may be taken to prevent it. They are inevitable.

The insane find their way to the almshouse, because, perhaps, during an interval of sanity, they apply to the authorities for assistance, and so are sent there without their mental character being known. Sometimes the proximity of the institution leads those in the neighborhood to send insane there, temporarily. Sometimes, for the sake of economy, the friends of the insane will place them in the almshouse to save the expense and trouble of a commitment to an insane asylum. Sometimes persons entering under the influence of alcoholism become violent, and require special care; and also, occasionally, idiots and epileptics progress in their disease, and suddenly have paroxysms of violent mania. I should say, from my own experience, that six per cent. may be counted upon as being insane, and two per cent. will be sufficiently disturbed to require private rooms—not basement rooms, as is common, but light and dry, though sufficiently strong.

The water supply is a very important consideration. Very often the supply of new institutions is found to be inadequate. I once heard of an almshouse which was provided with only one well, and this was actually pumped dry in preparing tea the first evening.

At Tewksbury, Mass., the daily consumption is about a barrel per inmate, that is, between forty and fifty gallons.

In the Worcester Asylum for Chronic Insane, during February and March, 1879, the institution was obliged to obtain its supply of water from the city while its own reservoir was undergoing repairs. The amount was measured with a meter, and showed that their daily average consumption was a trifle more than 100 gallons per inmate. It is probable, therefore, that in other places, where an approximation is made, the amount needed is not overstated as being fifty gallons for each person.

The amount of water used has an important bearing upon the question of sewage. Of course, the sewage will exceed in amount the water supply. This would seem to be a self-evident proposition, and yet this principle of calculation is often overlooked. Large amounts of money are expended in providing for the disposal of the sewage of institutions, without, in any degree, appreciating its quantity.

In very small institutions, these questions may be safely left to themselves, insisting merely that all sewers shall be closed for some distance from the house. At the rural town poor-farm, with its less than a dozen inmates, the life is very much that of a private family; but in city, county, and state institutions, with numbers varying from fifty to several thousand, there must be enlightened and comprehensive plans, and as with the buildings, so with drainage, a proper system should be instituted, even though the institution should be small originally.

Ventilation, though a hackneyed subject, is very often overlooked or misapplied. I have seen large buildings erected without a thought being given to this necessity.

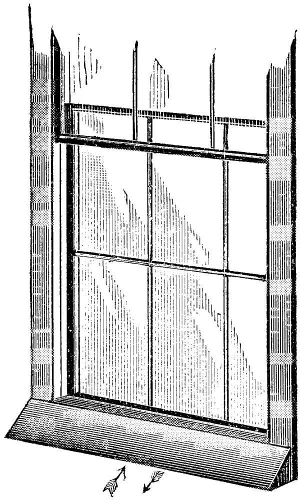
I beg leave to describe a cheap and simple device, designed to furnish window ventilation, where other means have not been provided. It is a shield of wood so made that, when the window is lowered at the top, the entering air is directed upward toward the ceiling. It can be easily applied to any building, with a design suited to the surrounding wood work.

Fig. 2 shows the window lowered and the ventilator therefore open. The air will go in or out, according to circumstances.

An excellent provision in the way of ventilation is to provide separate rooms for day and night use.

In the matter of bathing, a great evil is cold rooms. All persons need superheated rooms for the winter bath, since the wet

Fig. 2.



and naked body is more susceptible to cold than the same when clothed. Still, we often see the bath-room of a wealthy family unsuitably provided with heat; and the same in public institutions. In the almshouse particularly do the feeble inmates need extra heat.

Allow me, in conclusion, to recapitulate:—

1. An almshouse is for the feeble.

2. Some of its inmates will be insane.

3. Sewage accommodations should be ample.

4. Plans should contemplate enlargement. This costs no more at first, and saves money in the future.

MINUTES OF THE SECTION

ON

OBSTETRICS AND DISEASES OF WOMEN.

MINUTES OF THE SECTION

ON

OBSTETRICS AND DISEASES OF WOMEN.

TUESDAY, June 1, 1880.

THE Section on Obstetrics and Diseases of Women was called to order by the Secretary, Dr. ROBERT BATTEY, of Georgia, who announced the absence of Dr. ALBERT H. SMITH, of Pennsylvania, Chairman of the Section, by reason of long and severe illness.

On motion of Dr. H. O. MARCY, of Massachusetts, Dr. L. F. WARNER, of Massachusetts, was called to the chair. Dr. WARNER declining the honor, on motion of Dr. J. M. SIMS, Dr. G. M. B. MAUGHS, of Missouri, was elected to fill the vacancy.

Dr. J. MARION SIMS, of New York, read a paper on *Battey's Operation in Epileptoid Affections.* On motion, the paper of Dr. SIMS was referred to the Committee of Publication, with the request that it be published in the Transactions.

Dr. MONTROSE A. PALLEN, of New York, read a paper entitled *The True Import of Oöphorectomy or Spaying for Reflex Symptoms, more particularly in Epilepsy, Hystero-Epilepsy, and Catalepsy.* This paper was also referred to the Committee of Publication, with the request for its publication in the Transactions.

By request, the discussion of the two papers was opened by Dr. TRENHOLME, of Montreal, Canada, followed by Dr. MARCY, of Massachusetts, Dr. FINLEY, of Pennsylvania, Dr. ERICH, of Maryland, Dr. BATTEY, of Georgia, and Dr. SIMS and Dr. PALLEN, of New York.

Section adjourned.

WEDNESDAY, June 2, 1880.

The Section convened at 2 P. M., Dr. MAUGHS, Chairman, presiding.

Dr. JOSEPH TABER JOHNSON, of D. C, read a paper upon *The Management of the Third Stage of Abortion, with Retention of Placenta and Membranes.*

On motion, Drs. J. K. BARTLETT, of Wisconsin, H. O. MARCY, of Massachusetts, and JOHN MORRIS, of Maryland, were appointed a committee to consider and report upon the papers read before the Section.

The paper read was discussed by Drs. A. F. ERICH, of Maryland, WEEKS, of Massachusetts, JOHN MORRIS, of Maryland, HUBBARD, of New York, TRENHOLME, of Montreal, MARCY, of Massachusetts, ROSEBRUGH, of Canada, and HANKS, of New York.

Dr. ISAAC E. TAYLOR, of New York, exhibited a full-term uterus removed by gastro-hysterotomy from the living body, with explanatory remarks.

On motion of Dr. THOMAS HAY, of Pennsylvania, the thanks of the Section were tendered to Dr. TAYLOR for his very interesting and instructive presentation.

Dr. MARCY, of Massachusetts, exhibited a new uterine dilator of his own device.

Dr. T. GAILLARD THOMAS, of New York, read a paper entitled *A Clinical Contribution to the Subject of Removal of the Uterus, in whole or in part, for the Extirpation of Tumors connected with that Organ.*

On motion, the Section adjourned.

THURSDAY, June 3, 1880.

The Section convened at 2 P. M., Dr. MAUGHS, Chairman, presiding.

Dr. ADDINELL HEWSON, of Pennsylvania, read a paper entitled *Treatment of Fibroids of the Uterus by Dry Earth.*

Dr. B. F. DAWSON, of New York, read a paper entitled *Clinical Report on a Modified Operation for Cystocele.*

Dr. ROBERT BATTEY, of Georgia, read a paper entitled *Still-birth—Resuscitation after two hours and five minutes.*

On motion, Dr. MONTROSE A. PALLEN, of New York, was allowed the floor, and exhibited, for Dr. T. GAILLARD THOMAS, a specimen of special interest of dermo-dentigerous cyst of the ovary, recently removed with success. The thanks of the Section were returned to Dr. THOMAS.

Dr. R. TAUSZKY, of New York, read a paper entitled *Rest after Delivery—Treatment of Peritonitis.*

Dr. R. BEVERLY COLE, of California, made some remarks upon sponge tents and their mode of preparation. The subject was discussed by Dr. PALLEN, of New York.

Dr. BATTEY, of Georgia, presented a specimen of what he denominated a universal siphon catheter, with explanatory remarks.

Dr. HEWSON, of Philadelphia, concluded the reading of his paper upon Earth Treatment of Fibroids of the Uterus.

There being no report from the committee to whom the papers presented to the Section were referred, it was voted that these papers be transmitted to the Committee of Publication without any special recommendation.

Section adjourned.

ROBERT BATTEY, M.D.,
Secretary.

CLINICAL CONTRIBUTION TO THE SUBJECT OF REMOVAL OF THE UTERUS IN WHOLE OR IN PART FOR THE EXTIRPATION OF TUMORS CONNECTED WITH THAT ORGAN.

By T. GAILLARD THOMAS, M.D.,

NEW YORK.

The exigencies of modern surgery are very great; and instead of diminishing in number as unexplored fields are invaded and fresh positions conquered, they appear to develop new proportions. In our day we have seen paracentesis of the gall-bladder, the membranes of the brain and the pericardium; extirpation of the larynx and rectum; and ablation of the kidney and spleen, placed upon enduring bases as operative procedures; and gradually even the most conservative are yielding to the conviction that it has become essential that the uterus should be rendered amenable to complete removal.

There are three circumstances under which complete extirpation of the uterus may now be regarded as a legitimate and often a necessary procedure: first, where it is, after Freund's method, removed on account of malignant disease; second, where, as an addendum to the Cæsarean section, it is practised after Porro's plan; and third, where it is extirpated to render practicable the removal of tumors, either of solid or cystic character, which take their origin in its tissues, or, arising in the ovaries, form attachments to it too firm to be broken.

It is with the third and last of these indications that I propose to deal to-day.

I have said that the most conservative must gradually yield to the demand of modern surgery for the removal of the entire uterus by laparotomy; it is in this class of cases that they must first do so. It should not, however, be supposed that even here a conservatism, the honesty of which we must all respect, although sometimes boldly dissenting from its deductions, has yet been

fully satisfied. That this is by no means the case the following quotations from some of our best authorities will prove.

Barnes, writing so lately as two years ago, declares that "the time has not yet come for forming a confident opinion upon the practice of laparotomy for the removal of uterine fibroids, either alone or with the uterus. At present there is little ground for enthusiastic advocacy of the practice. The case may best be summed up by stating that the question is *ad hoc sub judice*. We must for a while be content with the divided opinions expressed in the Academy of Medicine on the occasion of a report presented by Demarquay on memoirs by Kœberlé, who advocates the proceeding, and by Boinet, who condemns it. Boinet showed that the operation had for the most part been performed accidentally in cases mistaken for enlarged ovary; that it could not be defended on the same grounds as ovariotomy; that it should always be rejected when the tumor was not pedunculated, and especially when it involves the entire or partial removal of the uterus. Demarquay agreed with Boinet. On the other hand, Richet cautioned the Academy against pronouncing any summary condemnation of an operation which at present is dreaded as ovariotomy once was." For myself, let me say that it is truly a sad spectacle for the world of surgery to behold the Academy of Medicine of Paris, the great deeds of whose founders have in times past electrified their contemporaries by their originality and brilliancy, to-day restrained by the warning voice of one man, Richet, from condemning a procedure which is as sure to be demanded by the surgery of the future as ovariotomy was by that of the past!

Emmet, in the second edition of a treatise upon gynæcology, of which all his countrymen feel justly proud, says: "To remove the uterus when enormously enlarged from a fibrous growth, is unquestionably one of the most formidable operations a surgeon can be called upon to undertake. The degree of success which has so far attended the operation offers but little encouragement for the future. M. Péan, of Paris, presented, in 1873, seven recoveries out of nine cases where he removed the uterus for fibrous growths. As this success has not been equalled by any other operator, we must suppose it to have been accidental, and that subsequently he himself has not been so fortunate, as already six years have elapsed since his last report."

I could go on quoting to this effect for any length of time,

but I lack incentive to do so; all my hearers know that the prevailing opinion goes with the eminent authors whom I have just quoted, and that I am to-day giving evidence in favor of a young and feeble cause.

An honest conservatism is the bulwark of scientific surgery, but there is no virtue so likely to run to dangerous extremes as this very one whose merits we are lauding. Let us remember how many life-saving procedures have been condemned in times past which to-day command our highest esteem, and let us be cautious how in a laudable effort to avoid recklessness, we repeat the errors of our forefathers in attempting to suppress what time has now, set its seal upon as valuable contributions to our art. Fifty years ago the operation of laparotomy for the removal of ovarian cysts was almost universally condemned as a surgical temerity for which it was very questionable whether the perpetrators ought not to be held amenable to the law. No epithets were regarded as too vile to be hurled as anathemas against the men who were regarded as so reckless as to peril human life by its performance, and it required a good deal of moral courage for one to be willing even to sanction by his presence a procedure about the surgical impropriety of which there was so unanimous a verdict. And let us not forget that results seemed for a long time to uphold the view of the majority. Many died of those operated upon, and few recovered; women suffering from obesity, tympanites, or pregnancy were, through errors of diagnosis, exposed to the great and uncalled for dangers of laparotomy; and even in simple cases intestines were torn, large bloodvessels severed, or sponges and instruments sewed up in the devoted bodies of the victims of reckless surgery often enough to give powerful arguments to the opposition.

Fifty years have passed away, and what is now the position of this "opprobrium chirurgiæ?" What the fate of the men who bore in its infancy the ignominy of sustaining it? McDowell, its discoverer, has just had a monument erected to his honored memory, and the names of Atlee, Peaslee, Wells, Keith, Kœberlé, Dunlap, and Kimball stand high in the annals of surgery. It has become rather a favorite mathematical exploit for anniversary orators to calculate how many centuries of life have been given to woman by the establishment of the operation of ovariotomy upon an enduring basis. We learn of twenty, thirty, forty, seventy successive operations without a single death; and

we hear one of the most eminent of ovariotomists declaring it to be "the safest of all the great surgical operations!"

It is with the desire to put upon record further testimony from which may be drawn reliable deductions as to the propriety of removing solid or cystic tumors by laparotomy, when such removal involves the necessity of ablation of the uterus, that this clinical contribution is made.

CASE I.—Dora G., single, aged forty-three, entered the Woman's Hospital in May, 1874. Six years previous to that time she had noticed an abdominal enlargement, which went on steadily increasing for three years, when she was told by a physician that it was a solid tumor of the womb. Two years before admission she was attacked by severe pain, which, from her description, was probably due to peritonitis. At the time of admission the patient was found to be very much emaciated, and the abdomen large and hard. She suffered greatly from constipation and from frequent micturition, and could sleep only in the sitting posture. The respiration was eighteen to the minute, pulse ninety-two, and large veins were found on the surface of the abdomen. The uterus could not be touched upon digital examination. The largest circumference of the abdomen was found to be fifty-two inches; measurement from pubes to umbilicus fourteen inches, and from ensiform cartilage to umbilicus thirteen inches.

The diagnosis of large fibrous tumor of the uterus was made, and upon consultation with Drs. Peaslee, Emmet, Metcalfe, Markoe, and Peters, operation was decided upon, and performed on the 18th of May.

An incision four inches in length was made from the pubes upwards, and the hand being introduced, the tumor was found everywhere adherent to the abdominal walls and intestines, which were firmly attached to its lateral and upper surfaces. The incision was now extended upwards, the adhesions broken, many vessels tied, and the tumor lifted from its position in the abdomen by two assistants. A temporary clamp was applied at the very lowest portion of the cervix, ligatures passed below it at right angles to each other, the pedicle securely tied, the clamp removed, and the stump kept between the lips of the wound by a long knitting-needle. A drainage tube was then introduced, the wound closed by silver suture, and the patient put to bed and quieted by opium.

The tumor was found to weigh exactly fifty pounds, and was a good specimen of uterine myoma.

In thirty hours after the operation it became evident that the patient was sinking from internal hemorrhage, and I opened the abdomen, removed a considerable amount of coagulated blood, and tied a large, bleeding vessel. As she did not rally, I transfused into her median basilic vein eight ounces of blood. After this she rallied and seemed much better. But oozing from large numbers of bleeding adhesions was evidently going on, and within the next twenty hours she sank rapidly. At the end of that time transfusion was again performed, and on the evening of the second day, that is, about fifty-one hours after the operation, she died.

The following is a transcript of a report of the autopsy by Dr. John N. Beekman, pathologist of the hospital. Autopsy made twenty two hours after death:—

"Body exsanguined, patient having died from hemorrhage. Decomposition commenced. No single point of hemorrhage could be discovered, but there seems to have been an oozing where adhesions had been torn through. On examining the kidneys the pelvis of the left was found distended with urine, and on following the ureter towards the bladder it was found sacculated at two places, and was finally discovered to be included in the pedicle, though it had escaped ligation. Both kidneys were fatty and very much softened. Their surrounding cellular tissue was infiltrated with blood."

Case II.—This case has already appeared in print. I cite it here merely to make my experience complete at a glance. Mrs. C., a multipara, aged thirty-nine, of spare habit, had enjoyed good health until 1876, when, after being violently kicked in the lower portion of the abdomen by a child two years of age, she suffered severe pain for several hours, which was accompanied by a profuse leucorrhœal discharge for a few days. Four months after this she felt in the hypogastrium a hard mass about as large as a walnut. For this she consulted a physician of Middletown, who regarded the case as one of anteversion, and treated it by replacement twice a week by the uterine sound. Great nervous disorder and menorrhagia soon developed, and the little mass rapidly grew. A consultation now being held, it was thought that pregnancy existed, and an

attempt at the production of abortion was made. At that time the tumor was as large as a three months' pregnant uterus, was movable, and not painful, though tender upon pressure. Another physician was consulted, who made the diagnosis of uterine fibroid, but thought that little or nothing could be done in the way of treatment. Dr. Mathewson, the present attendant, was then employed. Two years after this time pregnancy occurred, and advanced to a happy issue. During lactation, after this, the tumor could not be felt, but on the recurrence of menstruation the mass appeared as large as a three months' pregnant uterus, and, after a ride over a rough road, February 19, 1878, she suffered for some time from severe pains like those of colic. The tumor increased in size steadily, and abdominal dropsy supervened, which by July, 1878, became so marked, and so decidedly interfered with respiration, that she consulted a physician of Boston with reference to the practice of electrolysis. He removed the abdominal fluid by aspiration, lessening the patient's weight thirty-two pounds. From this time to November 20, she was tapped or aspirated seven times, and one hundred and ninety-five pounds of fluid were thus removed, the physician from Boston preferring this course to operation, which he thought would prove almost necessarily fatal. Soon after this time Mrs. C., acting under the advice of Dr. R. W. Mathewson, determined to visit New York and place herself under my care. I saw her on the 8th of December, and found her in the following condition: The abdomen was somewhat larger than it usually is at the end of the ninth month of utero-gestation, and upon palpation a large amount of abdominal effusion could readily be detected, together with the existence of a hard, rotund mass rolling about within it. Conjoined manipulation showed this mass to be connected with the uterus, and I decided that it was a round fibroid, of subserous character, growing, probably, from the fundus. The depth of the uterine cavity I do not remember.

Although Mrs. C. was much emaciated, and greatly enfeebled by repeated losses of serum from tapping, I advised in favor of laparotomy, upon the following grounds. First, a solid uterine tumor existed, which was beyond the reach of medicine, and which, having fully established ascites, would in all probability perpetuate this until death closed the scene. Second, the discomfort resulting from abdominal accumulation would surely require repeated tappings, and it needed no power of prophecy

to tell what would be the end of such a course; and, third, the remainder of her life would be necessarily an existence of suffering, while laparotomy might possibly result in complete recovery. These considerations being laid before Mrs. C., she unhesitatingly decided in favor of making one effort for life, even although it appeared to be a desperate one. As for myself, I never for an instant doubted what the line of duty was, where all looked so dark if operation was not decided upon, nor would an untoward issue have shaken my conclusion in the least.

On the 16th of December, at 3 P. M., laparotomy was performed, with the assistance of Drs. Hunter, Ward, Jones, Walker, and E. Mathewson. An incision about six inches in length was carried through the median line from a point below the umbilicus to one a little above the symphysis pubis. As this passed through the peritoneum, a very large amount of fluid escaped, and at once a large, round tumor presented itself to view. The surface of this presented a very peculiar appearance. Instead of looking like an ordinary fibroid, it was covered over thickly by a network of bloodvessels as large as the radial artery. These vessels did not belong to the tumor itself, but draped over it, and were slightly attached to its upper surface. They extended from the pelvic cavity upwards towards the omentum. I was at a loss to account for them, and can only offer, by way of explanation, the suggestion that they developed in some false membranous expansion, which, being absorbed, had left them in the position just described. These vessels were tied with silk ligatures, not separately, but three or four together, on each side of the tumor, and then they were cut in two. The tumor was then lifted up by my assistants, and was found to be attached to the whole fundus uteri; indeed, it seemed to be an expansion upwards of the uterus.

Estimating as well as I could the point at which the tumor began, and the uterus ended—for of this I could not be certain—I passed a large mattress needle through, and left it in place. Then passing a double ligature of twisted silk through, just above this, I tied the two halves of the penetrated uterine fundus very firmly, and cut the tumor off. How much of the uterine tissue was cut away I cannot say, but my impression is that as much was removed as could be taken, without opening into the uterine cavity. The abdominal wound was then closed by silver suture; the uterus, which was penetrated by the large

needle, being held as a pedicle between the lips of the wound, and an antiseptic dressing was applied. All pain was quieted by morphia, the patient ordered milk diet, and perfect quietude enjoined. At 7 P. M., on the day of the operation, hemorrhage occurred from the stump, but tightening the ligatures readily controlled this, and the patient went on to rapid and complete recovery. The operation being performed on December 16, on the 3d of January the patient was sitting up out of bed. At the end of a month she went to her home in Connecticut. Dr. Mathewson, writing on May 7, says, "Mrs. C. remains well." The tumor was a good specimen of the uterine fibroid, or myoma. It was as large as the head of a child of two years of age, and weighed three and a half pounds. Its tissue was not very dense, but no cystic formations existed in it.

Case III.—E. A., aged thirty-four, married fifteen years, and mother of three children, the youngest of which was ten years old, had nine years previously suffered from certain irregularities of menstruation, which led to the belief that she was pregnant. This opinion proved to be erroneous, however, and it soon became evident that the abdominal enlargement, attributed to utero-gestation, was due to a tumor in the lower part of the abdomen, a little to the right of the median line. When first noticed, this was as large as a child's head at birth, of which size it remained for four years; then it commenced to increase gradually until one year previous to admission to the hospital, when it developed very rapidly.

Three years previous she was confined to bed for five weeks by a violent attack of peritonitis. Until three weeks before entering the hospital, she had suffered but little pain; since that time she had experienced a great deal, and had been much annoyed by pressure of the tumor against the stomach and diaphragm, which caused indigestion and dyspnœa. During this time she had become rapidly emaciated, suffered greatly from night-sweats, and was unable to bear even the slightest exertion.

The measurements of the tumor were the following:—

Largest circumference	45 inches.
Pubes to umbilicus	13 "
Ensiform cartilage to umbilicus	11 "

Some doubt existed as to whether the tumor was uterine or ovarian; but gradually I became convinced that it was of the

former variety, and that its removal would involve ablation of a part or the whole of the uterus.

The patient's condition soon became so wretched that I thought that very little hope would attend operation, and I delayed a resort to surgical interference during January, February, March, and half of April. By that time her condition had somewhat improved from rest, the most nutritious diet, malt, and vegetable and mineral tonics; and as the only hope of saving her life evidently existed in the removal of the tumor, I operated.

An incision, four inches in length, was made from the pubes upwards, and a hard, solid tumor was found to occupy the abdominal cavity. In the hope of diminishing the size of this by the evacuation of fluid contents, I passed a long, slender trocar and canula into it, but without result. The incision was, therefore, prolonged upwards, so as to admit of the escape of the growth. On the right side very powerful adhesions were found to connect the tumor with the brim of the pelvis, which had to be broken very cautiously, as they were very vascular, and contained many arteries of considerable size, requiring ligation. In spite of every precaution, a good deal of blood was lost. On the same side the small intestines were very firmly adherent to the tumor, and were separated with considerable difficulty.

The tumor and the uterus, from which it grew, were now lifted well out of the pelvis, and a steel clamp, nine inches in length, was fixed around the uterus, at the internal os. The tumor was cut away, the stump thoroughly charred with the actual cautery, a glass drainage-tube passed down into Douglas's pouch, and the abdominal cavity, after having been thoroughly cleansed, was closed by silver suture. The operation, which was performed under the antiseptic method, lasted fifty-two minutes, and the tumor was found to weigh twenty-four pounds.

The patient was put upon the usual sustaining treatment adopted after ovariotomy, the temperature was kept at about 100° by affusion practised after Kibbee's method, but the pulse, which at the termination of the operation was 140, never came down to the normal standard, and on the third day became very rapid and feeble, and the patient died.

Case IV.—S. D., aged twenty-four, single, entered the Woman's Hospital, January, 1879. Three years before admission the patient had noticed an abdominal enlargement, which had gone

on slowly increasing until three months previous, when the increase became very rapid, and she sent for a physician, who told her that she had an abdominal tumor.

During these three years the patient had suffered little pain, but within the last year had steadily emaciated, so that on admission the arms, legs, and neck were greatly attenuated, the expression of her face anxious, and the complexion sallow and unhealthy.

At this time the abdominal measurements were the following:—

Greatest circumference	$37\frac{1}{2}$	inches.
Pubes to umbilicus	$9\frac{1}{2}$	"
Ensiform cartilage to umbilicus	9	"
Right anterior superior spinous process to umbilicus	$9\frac{1}{2}$	"
Left " " " " "	$9\frac{1}{2}$	"

Up to two weeks before admission to the hospital the patient had been comparatively well, but at that time she had slipped in going down stairs, had struck violently upon the buttocks, and had since suffered from general malaise, feverishness, and pain over the whole abdomen. Upon examination the tumor, which was recognized as a uterine fibroid, was found to be exquisitely tender over its whole surface. The temperature of the patient was found to vary from 102° to 103°; and the pulse to range from 110 to 120. Some years ago I saw, in consultation with Dr. Noeggerath, the wife of an eminent physician of this city, who presented a history very similar to that just given. The patient had suffered for ten years from a large uterine fibroid, and felt comparatively well until one day she slipped upon the ice and fell heavily upon the buttocks. After this uterine hemorrhage came on, septicæmic symptoms developed themselves, and the patient died. Autopsy revealed the existence of a clot of blood as large as a cocoanut in the centre of the tumor. It was a true hematocele, which had taken place in the tumor in consequence of the rupture of a blood-vessel produced by the fall, and had given rise to septicæmia. Dr. Noeggerath very cleverly made a diagnosis of this previous to death.

I ventured to make a similar diagnosis in the patient whose case I am now relating, and on account of it hastened operation.

The tumor was removed by abdominal incision, and a large clamp placed around the uterus about its middle. The operation was performed under the antiseptic method, lasted thirty-

seven minutes, and the tumor weighed twenty pounds. An incision through the centre of this revealed the existence of a mass of grumous blood about equal in size to a cocoanut. This had evidently been the focus from which septicæmia had taken its origin.

The patient was sustained after the operation by nutritious enemata, hypodermic injections of brandy, and small amounts of food and stimulants by the mouth. Pain was quieted by opiates used by rectum and hypodermically, and the temperature, which showed a marked tendency to rise, kept at about 100° by affusion after Kibbee's method; but the pulse steadily increased in rapidity and diminished in force, and on the fifth day the patient died.

Autopsy showed a small amount of peritonitis only.

Thus far my experience in removing tumors involving removal of the uterus had been by no means flattering. Out of four cases three had died and one had recovered! But I was encouraged to persevere by the facts that I saw several points in which I could improve my patients' chances, and that I had thus far operated solely upon cases in which the only possible chance which could be offered the patient was a resort to surgery. I felt conscientiously that to deprive the patients of this, even although it were not a very bright one, when the alternative was certain death, was not in accord either with the dictates of true surgery or of enlightened humanity.

Case V.—Mrs. E., aged fifty-four, native of Dover Plains, New York, the mother of one child twenty-seven years of age, was admitted to the Woman's Hospital, December 18, 1879. The patient had noticed a hard lump fourteen years before, and twelve years previous to admission had consulted Dr. Emmet, who pronounced it a fibrous tumor. Since that time it had steadily increased until it had reached very large dimensions.

During the patient's stay in the hospital prior to operation, she suffered very much from indigestion, constipation, and dyspnœa. Her expression was anxious and her limbs much emaciated. Upon physical examination the uterus could nowhere be touched, so completely was it drawn up out of the pelvis.

On the 3d of January the tumor was removed. An incision four inches long being made from the pubes upwards in the median line, a very large tumor was exposed, which was half

solid and half fluid in character, and which was fortunately found but slightly adherent to the abdominal walls. The fluid portions of the tumor, constituting probably a little more than half of its bulk, were evacuated by a long, slender trocar, and the incision being then prolonged the solid portions of the tumor within reach were removed from the abdominal cavity. It was found that the tumor had drawn the uterus high up out of the pelvis, and that that organ was so thoroughly united to it, that uterus, ovaries, and tumor would have to be removed together. The bladder was stripped away from its attachment to the anterior wall of the cervix, the vagina just below the os externum was transfixed by Peaslee's needle, a strong, double carbolized silk ligature was drawn into position, the mass cut away removed, and the abdominal cavity, after having been thoroughly cleansed, closed by silver suture.

The patient was put upon the customary treatment after ovariotomy, all pain quieted by opium, nutrition kept up by enemata, and the temperature kept at about 100° by Kibbee's method.

On the 29th of March, eighty-five days after operation, the patient returned to her home well.

I have heard from her within the past month, and she tells me that she has entirely recovered.

The tumor was carefully examined by Dr. W. H. Welch, pathologist of the hospital, and was at first thought by him to be a uterine fibro-cyst. Upon more careful examination, however, he found it to be an ovarian tumor of composite form, which had developed between the layers of the broad ligament and forced the uterus out of the pelvic cavity.

The tumor and uterus were upon his examination found to be entirely inseparable.

Case VI.—Mrs. J. E., aged fifty-nine, the mother of six children, was admitted to the Woman's Hospital, January 26, 1880. Three years ago she noticed a small tumor in the right side of the abdomen. For two years this had grown slowly, but during the last year had developed very rapidly indeed. During that time she had become very much emaciated, and upon my first examination had an anxious facies, a reddish tongue, and slight œdema of the feet. Physical examination revealed a very large abdominal tumor, the uterus much elevated in the pelvis, sur-

face of tumor irregular, and the growth evidently consisting of a mixture of solid and fluid elements.

The following was the result of abdominal measurements:—

Greatest circumference	44	inches.
Pubes to umbilicus	9	"
Ensiform cartilage to umbilicus	9	"
Right anterior superior spinous process to umbilicus	11	"
Left " " " " "	$12\frac{1}{2}$	"

On the 22d of February I removed the tumor through an incision in the median line five inches in length. By means of a trocar I evacuated a large number of cysts, and by powerful traction drew out the solid masses of the tumor, to which I found the uterus so firmly attached that its separation was out of the question. A portion of the sac dipped into the pelvis behind the uterus, and was so adherent there that it was impossible to remove it. Drawing this up as far as possible, I surrounded it, the remaining portion of the sac, and the uterine neck at as low a point as I could without compressing the bladder with a large clamp, and cut away uterus and sac. I then cauterized the stump thoroughly with a hot iron.

The patient was put upon the usual treatment, and the sac syringed out with carbolized water every fifth hour. A day to day record of the progress of the case would be as unnecessary as it would be wearisome. It suffices to say that the patient entirely recovered, and was discharged from the hospital on the 19th of May, three months after the operation.

The portion of uterus within and below the clamp, which was removed on the fourteenth day, entirely sloughed out; the opening which was left by its removal being slowly filled up by granulations.

The tumor examined by Dr. Welch was found to be a composite ovarian cyst, very similar to that last described.

Case VII.—Mrs. E. B., age uncertain, but probably about forty, a native of Oldtown, Maine, married eight years, and mother of one child seven years old, entered the hospital in February, 1880.

Two years ago patient noticed a hard lump in the left iliac fossa. This continued to grow for a year, when it suddenly disappeared with great pain and prostration, and her physicians declared that the tumor had burst. After a month, however,

it reappeared, and for the past year has increased very rapidly. She suffered from occasional pain through the pelvis and a sense of weight and pressure from the tumor.

The abdominal measurements were the following:—

Greatest circumference	34½ inches.
Pubes to umbilicus	8 "
Ensiform cartilage to umbilicus	8 "
Right anterior superior spinous process to umbilicus	9 "
Left " " " " "	8 "

On the 23d of March the tumor was removed through an incision five inches in length through the median line. By means of a trocar a large amount of thick, bloody fluid was evacuated, but on the right side there was a hard mass the size of a seven-year old child's head, which had to be dragged through the opening. To this the uterus was firmly adherent.

The lower portion of the sac, that within the pelvis, was so completely adherent to large folds of small intestines, that separation could not be thought of. Lifting the uterus, solid mass, and liberated portion of the sac high out of the pelvis, I now applied my large steel clamp as low down on the cervix anteriorly as the vesical attachment would permit, and as low down posteriorly as the point at which the intestines were attached, I inserted a drainage tube, tightened the clamp around the whole, and cut away the uterus and the tumor.

The pedicle was then prevented from slipping by being transfixed just above the clamp by four knitting-needles, passed at right angles to each other, the stump was thoroughly seared by the actual cautery, the abdominal cavity cleansed and the wound closed by silver suture.

The operation was performed under the antiseptic method, and lasted forty minutes. The tumor weighed twenty pounds and a half.

The patient was put upon the usual treatment after ovariotomy, and the retained sac syringed out with carbolized water every five hours.

The patient developed no bad symptoms and went on to complete recovery, being discharged May 17th, a little less than two months after the operation.

The portion of the uterus in and below the clamp entirely sloughed out; the cavity which was left healing by granulations, so that no trace of the organ remained.

Dr. Welch, who pronounced the tumor to be a very peculiar form of uterine fibro-cyst, or cysto-myoma, has very kindly handed me a very elaborate report of it, which I here append.

Dr. Welch's report of Mrs. B.'s case.

"CYSTIC MYOMA.

In connection with the part of the tumor extirpated, there were removed both ovaries, the fundus and upper part of corpus uteri, the left Fallopian tube entire, a part of the right tube, the left parovarium, and portions of the broad ligaments.

The portion of the cyst wall removed (apparently its upper and anterior portion) measures 24 centimetres in breadth (laterally), and 18 centimetres in height (vertically). Its median surface is in close apposition with the portion of uterus removed, but is separated from it by a little lax connective tissue. The cyst wall is furthermore adherent to fundus uteri by old fibrous adhesions. The portion of uterus removed measures 6 centimetres in breadth at fundus, 4 centimetres in length, and 3 centimetres in antero-posterior diameter. A probe passes $2\frac{1}{2}$ centimetres into the uterine cavity. The left Fallopian tube, with its fimbriated extremity, has been removed entire. It measures 11 centimetres in length, is pervious, and appears normal. It is separated from the outer surface of the tumor by the upper portion of the broad ligament (mesentericus tubal), in which can be distinctly seen the normal contours of the parovarian tubules. The right Fallopian tube has been severed close to the uterus; but a detached portion, measuring 10 centimetres in length, and not including the fimbriated extremity, has been removed, and remains attached to the tumor by a short mesenterium tubal. With this exception, none of the right broad ligament was removed, it having been cut close to the uterine wall.

The right ovary was removed, and is present in a separate piece. It is of normal dimensions and appearance. It contains two corpora lutea, one small and yellow, the other large, with gray convoluted walls and bloody contents. (These were proven to be corpora lutea by microscopic examination.) The left ovary has also been removed, and lies at the line of junction of left mesenterium tubal, with cyst walls. Although preserving the

contours of a normal ovary, it is much flattened out by the pressure of the tumor. It measures 5 by 4 centimetres. It presented under the microscope the normal ovarian stroma, containing even ova, but no large Graafian follicles, and showed clearly the parenchymatous and vascular zones. The left ovarian ligament is very much thickened, and for a portion of its extent is incorporated with the cyst wall. The right ovarian ligament was cut off close to the uterus. With the exception of a subserous myoma, about the size of an almond, near the left cornu, the uterus appears essentially normal. The tumor, as far as can be judged from the portion removed, is a unilocular cyst. Its external surface is smooth and glistening, and presents numerous fibrous adhesions. The peritoneum passes continuously from the uterus and the upper portion of the broad ligament upon the outer surface of the tumor. The tumor seems to have grown between the layers of the lower part of the left broad ligament, and into the pelvic and surrounding connective tissue, displacing the uterus forwards and upwards, and contracting adhesions with the right ovary and Fallopian tube. The wall of the cyst varies considerably in thickness in different parts. Its average is 4–6 millimetres in thickness; but in some places it is very thin, measuring only 1 millimetre; in others very thick, 4–5 centimetres. The thickest part of the wall corresponds to an ill-defined myomatous growth, in its anterior wall. There are several smaller myomatous nodules in the cyst wall, some distinctly circumscribed. In most places, two layers can be distinguished, of about equal thickness, in the wall, firmly united, an outer, laxer and paler, and inner firm and gray.

The microscopical examination shows the chief constituent of the cyst wall to be smooth muscular tissue, in the form of interlacing bundles and fibres. These muscular fibres have no more regularity in their arrangement than in an ordinary uterine myoma, appearing now as longitudinal, and now as transverse or oblique sections. The smooth muscular tissue is mixed with a considerable amount of connective tissue, which in many places, especially in the outer wall, is distinctly mucoid in structure. The inner layers are in many places rich in round and flat cells, and contain considerable yellowish blood pigment. There is no epithelial lining to the cyst, although the inner surface is comparatively smooth; in many places quite as smooth as

in ordinary parovarian cysts. Careful search was made both upon the fresh and hardened specimens for an epithelial lining. In most places the smooth muscle-fibres closely compacted, and in parallel arrangement, constitute the inner lining. In some places the inner border is hyaline and structureless. There are numerous lymph-spaces (interstices) in the cyst wall, but they are of microscopic dimensions, and not notably dilated. It is not apparent in what way the cyst-cavity was formed, or what metamorphosis the muscular tissue has undergone in its development.

The fluid contained in the cyst is thin, dark-brown in color, neutral in reaction, and of a specific gravity of 1012. It contains mucin in small amount, and also gives the reactions of alkali-albumen, with acetic acid and its alcoholic precipitate (so-called paralbuminous reactions). It contains a large amount of serum-albumen. It has no tendency to coagulate spontaneously. A considerable sediment settles at the bottom, consisting in greatest part of red blood-corpuscles (to which the fluid owes its color), some white blood-corpuscles, and granular corpuscles, most of which contain a nucleus. There are in addition some free fat molecules, brownish pigment, and a few corpora amylacea."

It will be seen that this paper embodies the results of seven cases, in one of which the whole fundus, in one the whole body, and in five the entire uterus were removed. Four of the tumors demanding the operation were large solid fibroids, with no cystic elements; one was a fibro-cyst, partly solid, and partly fluid; and two were peculiar ovarian tumors, which, developing between the layers of the broad ligaments, lifted the uterus entirely out of the pelvis, and made it a mere addendum to their walls.

Out of the seven cases four recovered, and three died. The three fatal cases were all operated on for large solid tumors. Of the four successful ones, one was a case of solid uterine fibroid, one a case of large fibro-cyst, and two were cases of ovarian cysts, with large amounts of solid material in their walls. In recognizing this fact, it must be borne in mind that a tumor susceptible of diminution of size by tapping does not render the operation of laparotomy as dangerous as one which, being entirely solid, involves the necessity for a long abdominal incision.

As far as my knowledge extends, no one in our country has

had so large an experience in this formidable operation as our distinguished Fellow, Dr. Gilman Kimball, of Massachusetts. He informs me that he has removed the uterus fourteen times, nine times for solid, and five times for fibro-cystic tumors, with the excellent result of six recoveries and eight deaths. In some of his cases the whole, in others a part only, of the uterus was removed.

Let us hope that the next decade will give us even better results than these, and that an operation *ad hoc sub judice* may by the end of that time have achieved for itself a firm and enduring position.

ON THE MANAGEMENT OF THE THIRD STAGE OF ABORTION, WITH RETENTION OF MEMBRANES.

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The main indications for the treatment of abortion are clearly enough set forth in our systematic treatises on midwifery in present use in our schools, and several points have recently been prominently discussed in obstetrical and gynæcological societies and medical journals relating to a better control of hemorrhage, and the necessity of greater care in the after treatment of women who have recently miscarried, as a means of prophylaxis against the occurrence of diseases requiring later on the services of the gynæcologist.

Playfair lays some stress upon this point, and declares that sufficient attention is not devoted to this very important item of treatment, and thinks it a frequent source of trouble on the part of patients who have miscarried.

To one acquainted with the more recent obstetric literature, the treatment of abortion is not especially a vexed question until he arrives at the stage which I have selected as the subject for discussion in this short paper.

In cases of too early rupture of the amnion, as the result of strong uterine contractions or too persistent digital manipulation, and a fœtus, say under the fourth month, is expelled; and the secundines are retained by the premature contraction of the internal os uteri, where little or no hemorrhage occurs; the patient is feeling comfortable, and no immediate danger seems impending—the *questio vexata* which needs authoritative solution is, what are we to do? What is the measure of our responsibility?

The patient and her family, reposing implicit confidence in the physician of their choice, rely confidently upon his advice and counsel at such a time as this. He is supposed to know the dangers, and is looked to for such treatment and suggestions as

will effectually ward off their approach, and restore the patient to her previous health, uninjured by their menacing presence.

We are expected to look into the future and see the liability of the occurrence of hemorrhage, placental polyps, subinvolution, uterine displacements, and their attendant evils. They cannot, and consequently trust to us to shield and protect them; and when it is advised that nothing further be done, that nature be trusted to expel in her own time and way, or perhaps to absorb, the contents of the uterus, they are well satisfied and pleased to be let alone, resting in the security of our counsel.

Patients thus managed pass too frequently from the care of their medical attendants as cured, only to return months thereafter with one of the above-mentioned ailments for treatment, or into the hands of another physician, who may or may not recognize the cause of the trouble. Should he in his diagnostic investigations come upon portions of retained placenta or partially putrid membranes, the chances are that the patient will lose confidence in the physician through whose neglect, ignorance, or inattention she has suffered so much pain, sickness, and expense.

Instead of the picture presenting itself in this light, hemorrhage, fetid discharges from putrid secundines, chills, fever, and septicæmia may early occur, and we may scarcely be able to save the life which we should never have allowed to be so seriously threatened.

I desire to discuss this question from the affirmative side, and to state as a general principle of sound treatment, that a woman is never safe until all matters connected with the pregnancy are expelled from the uterus, and that our chief indication for treatment is to cause their immediate removal.

The cases where the medical attendant should feel justified in leaving the house of a patient whose secundines are still in utero, should constitute very rare exceptions to the general rule, and in these instances antiseptic injections, carbolized tampons, and constant watchfulness should be observed to protect the patient against the sudden occurrence of hemorrhage or septicæmia.

To those who agree to the affirmative side of this question, the presentation of this subject at all may be a matter of surprise; and in order to justify myself in their eyes for bringing forward so stale a subject for consideration in this body, I feel compelled to state my belief that a large number of practitioners

throughout the country do not hold these views, or practice them in the treatment of their patients.

This is proved by a recent discussion of this very point in the New York Academy of Medicine, where a distinguished Fellow remarked, that "he was not only surprised, but a little shocked, to find so many men who were in favor of allowing the placenta, as a rule in those cases, to remain undisturbed."

The President of the Obstetrical Society of Edinburgh, in noting the recent improvements in Obstetrics and Gynæcology, said, in his inaugural address in November, 1879, "I may notice the great improvement of late years in the treatment of those troublesome cases of hemorrhage following abortion in early months, where part of the placenta and membranes is retained, and where the os is closed, so that a finger cannot be admitted, as not unfrequently happens, when by opening it up, by means of a sponge or tangle tent, so as to get access to the source of the bleeding and discharge, and removing this by means of the finger, or otherwise, we relieve the patient from a position of considerable peril."

Until recently, the general teaching of the text-books has been in favor of temporizing. As far as they gave any definite instructions, it was to the effect that, if difficulty was encountered in the delivery of the after-birth, or membranes, more injury was likely to result from the manipulation necessary for their removal than would occur, if it was left alone, and nature trusted to take care of it.

Angus McDonald, in a paper published in February, 1880, in the *Edinburgh Medical Journal*, states the case in very nearly opposite terms. He says: "I believe also that more harm is likely to result from under-caution than from undue interference in such cases; at least, experience has led me to believe that a *majority of our professional brethren* are more apt to err in this particular, through defect, than through excess of activity. The result is that their patients are liable to be landed in troubles that are much more serious than any dangers, real or imaginary, connected with a thorough evacuation of the uterus. To put it plainly, I believe a patient is put to greater danger from a portion of the membranes being left in the uterus, to become organized there, and a source of persistent menorrhagia, than one is likely to suffer from the manipulation necessary to secure complete removal of every part of the ovum in miscarriage."

Dr. J. Veit, of Berlin, recommends more active measures than the text-books to empty the uterus, in such cases of delayed abortion as threaten danger to the mother from absorption of putrescent portions of the embryo or its envelopes.

He gives an account of two cases where he was obliged to hurry the expulsion of the contents of the uterus on the sudden occurrence of rigor and high fever. The temperature rose to 105° in both cases. They were successfully treated by complete evacuation of the uterus, and antiseptic injections.

The clinical history of cases is better evidence than any amount of theory, and I therefore beg to recite briefly the history of four instances coming under my own observation, and presenting different phases for treatment.

Case I.—In October, 18—, I was called to see Mrs. ——. She had been under the care of a German midwife. I found that she had been delivered of a fœtus, at the tenth week of pregnancy, ten days previous to my call. Nothing unusual occurred during the labor. She lost no great quantity of blood; the fœtus had been clearly recognized in the discharges; no membranes came away; considerable ergot had been administered, severe pains were produced, but nothing was discharged from the uterus. She did well for several days. In about a week, however, the discharges became offensive, she had repeated chills, night-sweats, fever, furred tongue, high temperature, anorexia, and exhausting diarrhœa; no pain.

Upon my first visit, after learning these facts, I dilated the cervix, and removed a most offensive mass from the uterus washed out its cavity with antiseptic injections, and placed her upon a nourishing diet—iron, quinine, etc. Improvement dated from that hour. She made a slow, but perfect recovery, and I have since delivered her of two healthy children.

Case II.—In July, 1878, I was requested by my friend, Dr. Prentiss, to assist him in the management of a case of a lady who had three days previously aborted of a four months' fœtus. Notwithstanding the administration of about two ounces of Squibb's fluid extract of ergot, the placenta and membranes were still in utero. For two days little hemorrhage occurred, and the patient had felt as well as could be expected, except for the pains excited by the ergot.

The night previous to my being associated with the case, the lady had been seized with a severe chill, had high fever and delirium, with slightly fetid discharge. The immediate removal of the placenta was agreed upon. We gave ether, and at the request of the doctor, I passed my hand into the vagina, dilated the cervix by digital manipulation—though we had the Barnes dilators ready for use—passed two fingers into the uterus, which I pushed down into the pelvis with the other hand, applied externally, and removed the placenta. It was quite firmly attached to the walls of the uterus, and had to be taken away in small pieces.

The subsequent treatment was similar to that of the preceding case. The lady made a good recovery.

Case III.—In December, 1879, I saw Mrs. A., also in consultation with Dr. Prentiss. It was his opinion that she had been taking means for the production of an abortion. She was a little over three months advanced in her third pregnancy. The fœtus had been expelled before the doctor's connection with the case. This lady lost much blood previous to the delivery, during the labor, and after the expulsion of the fœtus.

I saw her on the evening of the third day; the placenta and membranes were still in the uterus; the patient was pale, very nervous, and weak from loss of blood; there was no foul odor to the discharges; pulse and temperature slightly above 100°; blood was constantly oozing away; the patient and her family were considerably alarmed for her safety. She had taken liberally of ergot, and the internal os would admit of only the tip of the examining finger. We hesitated to give ether in her weak state, but, fearing that the loss of more blood might prove fatal, finally administered it. She seemed to improve under its influence; and while the doctor made pressure over the abdomen, I gradually passed my hand into the vagina, and without difficulty dilated the cervix sufficiently to get the index finger through the internal os. The placenta was adherent in nearly all of its extent. I gently detached small portions of it at a time, removed all that I could, and with antiseptic injections thoroughly washed out the uterus. It contracted firmly, little, if any, hemorrhage took place, and the patient recovered, and has since been well.

CASE IV.—Was called in the night hurriedly to see Mrs. P., March 24, 1880. She was flooding severely, and having regular labor-pains at intervals of ten minutes. She was a young primipara, and only six weeks pregnant. The os was dilated to the size of a five-cent piece, and the ovum could be felt protruding.

Under the influence of ergot and vaginal tampons, the pains increased in rapidity and strength, and the fœtus was soon expelled. It was about the size of my little finger. I waited for the expulsion of the membranes; gave more ergot; the pains were excessively severe; she suffered from them much more than during the delivery of the fœtus. I finally tamponed the vagina and left for home, hoping it might be expelled during the night.

The next day I removed the tampon, and could distinctly feel the membranes high up in utero. She was feeling very well, and wanted to get up. I gave her more ergot, washed out the vagina with carbolized water, and put in a fresh tampon. The pains excited by the ergot were so distressing that the husband called upon me three times during the morning, urgently requesting that something be done to quiet his wife's sufferings.

In the evening I combined McMunn's elixir of opium with the ergot, and gave forty drops of each. The pains became so unbearable that I finally had to administer morphia to quiet her agony. She became absolutely uncontrollable, and in attacks of pain could scarcely be held on the bed.

In the mean time great sensitiveness had developed over the uterine region. She lay with knees drawn up, had dry, brown tongue, complete loss of appetite, night-sweats, chilly sensations up and down the spine. The pulse and temperature were not above 100. No more hemorrhage occurred; there was the faintest odor upon the finger after an examination.

On the morning of the third day a consultation was held at my request. The consultant distinctly felt the membranes through the os uteri, but on account of the tenderness about the uterus and pelvic tissues counselled against operative procedure, and advised the further use of ergot and the opium elixir.

Terrible pains were excited by the ergot. I allowed them to last several hours, but finally gave $\frac{1}{4}$ grain sulph. morphia and 30 grains bromide of potass. in a powder, and applied hot fomentations over the hypogastrium. I gave no more ergot.

The os uteri, under the contractions produced, was becoming

so small that I could scarcely get the tip of my finger through sufficiently to free the membranes. By firm pressure, however, on the fifth day after the expulsion of the fœtus I depressed the uterus and detached some small, partially decomposed masses.

Strict watchfulness was constantly observed. Antiseptic vaginal injections were used several times daily as long as any odor or discharge remained, and nothing more was done except to administer tonics and nourishment. She gradually regained her health, and in a month was riding out, and now looks well. She has menstruated twice since her recovery; at first the flow was black, thick, and offensive, but subsequently became clear and free from clots. There was nothing unusual noticed about her second period, and no hemorrhage occurred in the interval.

Nothing has ever been seen of the retained membranes. The injections and all discharges were carefully watched and inspected, and nothing resembling the masses removed by my finger has ever come away. They may have become liquefied and passed without the knowledge of the patient. They may be there yet. I think neither theory is correct. Nothing was observed to come away, and the menstrual flow is now natural in color and quantity, and painless.

Especial attention is directed to the unusual effect of ergot upon the circular fibres about the internal os uteri in some cases of abortion in the early months. The pains produced by its administration in the case just recited were simply terrible. The patient was only six weeks pregnant. The os, which had previously been sufficiently patulous to allow the admission of the first phalanx of the index finger, with which the mass of membranes could be distinctly felt, was under the influence of ergot completely closed, and remained so for some time afterwards. The very means used for exciting more powerful uterine contractions seemed to be the cause of the failure to effect their expulsion. The circular uterine muscular fibres near and about the internal os appeared to receive the effects of the oxytocic first, and when the fundus and body of the uterus contracted, the advance of the contained mass was resisted, and the pains were intensified and rendered of none effect. I have noticed this fact in other cases. Noegerath has reported similar effects of ergot in abortion, in the *American Journal of Obstetrics*.

With my experience the retention of a small piece of placenta or membrane has been accompanied by increased flow which

was more or less constant, sub-involution, frequently by displacement on account of its increased size and weight, and the various other symptoms which naturally result from such conditions.

I have removed several placentæ or parts of placentæ, and portions of membranes, months after a miscarriage, when the above symptoms had been observed. If the placenta is ever absorbed, this is possibly one of the cases.

This lady made a narrow escape. The error was in not persisting in the removal of the secundines immediately after the delivery of the fœtus. There probably would have been some difficulty in their complete removal, but the pain and the risk would have been *slight* in comparison to the agony which she suffered from the effects of the ergot, and the risks of impending anæmia and blood-poisoning.

I can readily understand how we might feel justified in permitting delay in some cases, when there is great nervous excitement or exhaustion. These might, perhaps, better be allayed or overcome by appropriate treatment, keeping a most careful watch, in the mean time, for symptoms indicative of trouble, and acting promptly should they arise. Hemorrhage might have been so excessive as to make delay for a short time the wiser plan. The added shock of immediate removal might better be delayed until reaction had set in.

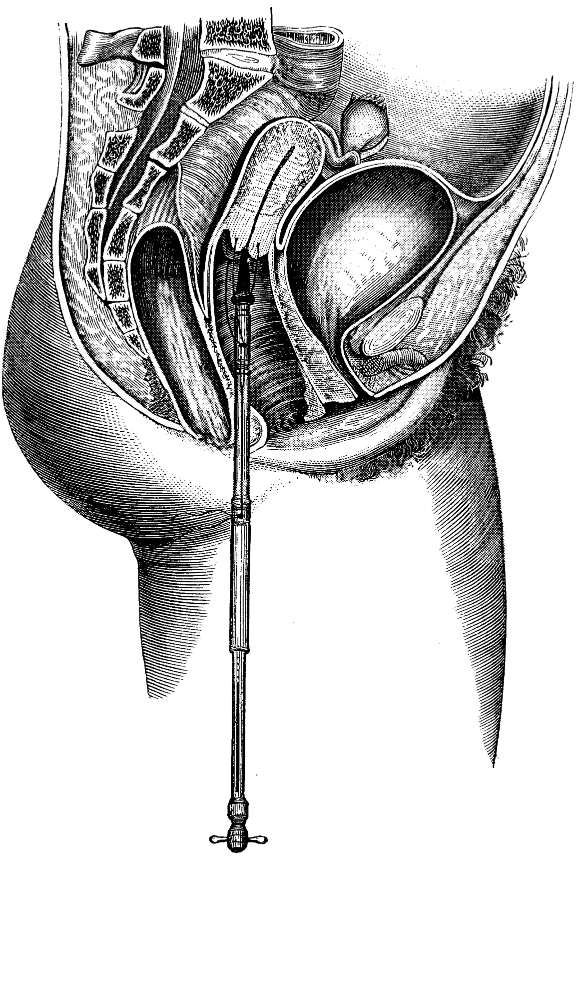
The point which I wish to emphasize, and which this paper is presented to emphasize, is, that the patient is not safe until her *uterus is empty and firmly contracted;* and that it is the duty of the attending physician to see that these ends are accomplished before he leaves the case.

The President of the New York Obstetrical Society, in 1878, when this subject was being discussed, said: "The sooner the uterus is emptied, the sooner can the physician feel that the patient is safe. If the cervix is not dilated, which is rather a rare occurrence, and there is no hemorrhage, it should be dilated at once, and the placenta removed." If left behind, and serious trouble ensues, the responsibility should be placed upon the physician, who knowingly left this secret enemy lying in ambush ready to spring at any favorable moment upon the fair and trusting patient, poisoning her blood, devouring her strength, and perhaps killing her outright. A septicæmia once set up by the absorption of putrid material cannot always be relieved by its

speedy removal, and the vigorous use of antiseptics. It may be too late.

The general principle, then, of securing the complete and speedy removal of the contents of the uterus, and its firm contraction after abortion, I insist upon as the only safe practice. The rare exceptions demand the closest watchfulness.

PLATE I.



A NEW INSTRUMENT FOR DILATING THE CERVIX UTERI, AND RESTORING THE INVERTED UTERUS.

By HENRY O. MARCY, M.D.,

MASSACHUSETTS.

The instrument which I have the honor to present to you to-day is the result of two years' experimenting, and may be considered sufficiently complete to merit your criticism.

It was first designed to aid in returning an inverted uterus. One considerably long band of moderately thin, pure rubber was split at each end, nearly to its middle; this part was placed over the inverted fundus, and each of the four ends was threaded through four firm metallic rings, which had been securely stitched into the cervical portion of the uterus. These ends were drawn through a fenestrated wooden tube, the distal portion of which ended in a cup-shaped depression, to receive and support the fundus.

Elastic tension was thus secured, which could be graduated as desired.

It was thought that the same force could be equally well used to produce the dilatation of the cervix uteri.

The instrument presented was modified, as shown in Plate I, after using for a period the elastic rubber bands, carried through two or four rings, securely stitched into the cervix uteri, and then—as in the case of inversion of the uterus—through a fenestrated tube, terminating in a cone-shaped point, which could be carried at pleasure, with such force as was deemed advisable, into the cervical canal.

Having ascertained by experiment that rings thus fixed would not cut out under tension, one of the first things to be desired was to know the amount of force used, and this ascertained, to keep it at work under intelligent control. For this purpose, it seemed not only necessary to know the progress made, by frequent examination, but also the exact pressure used.

This is accomplished by a spiral spring, and the force applied is marked upon a scale graduated in pounds; by turning the end of the instrument, as in the ordinary *écraseur*, this can be increased or lessened at will.

It is graduated to register a pressure of fifteen pounds, much more, as I believe, than will be required in actual use. A constant elastic force thus obtained in the use of the spring, the rubber bands were no longer needed, and dispensing with these, enabled us to do away also with the rings, and thus the operation is simplified to the use of two, four, or more threads, single or double, as may be preferred, to be carried through the cervical tissue, and tied over the projecting ends of the slide upon the barrel of the instrument covering the spring, and the force adjusted as deemed desirable.

I have used this instrument under very varying conditions of the cervix. The threads have never cut the tissue, and it is surprising that so little pain is experienced during dilatation. Inflammatory action has never supervened; but I believe it a wise precaution to wash the vagina carefully with a one to twenty solution of carbolic acid at operation, and after to use a light carbolized vaginal tampon.

As will be seen, there are a number of different sizes, even to one that is one and a half inches in diameter, as also a cup-shaped end to be used in cases of inversion of the uterus.

In the multiplicity of surgical inventions of the present day, it may be held that no one has a right to present a new instrument, unless it can be asserted that it will accomplish the object to be attained better than anything hitherto offered. In certain ways, we claim this much for our new instrument. A well-known and most serious objection to every uterine dilator now in use, from the tent of sponge or other material to the Barnes (or Molesworth) dilator is, that it is and must be an irritant to the cavity of the uterus.

Many fatal accidents have occurred from this cause alone. Where the least resistance is offered, there the material used expands soonest, and the uterine cavity is usually filled completely, before the dilatation of the constricting fibres of the uterine neck commences. When we remember the delicate mucous membrane with which the uterine cavity is lined, the utricular glands which in immense numbers open into it, and the vascularity of its body, we can only wonder more serious

accidents do not happen from the use of the ordinary intra-uterine tents. All such danger is avoided by the application of elastic dilatation as used with this instrument.

The uterine cavity is undisturbed when care is exercised, and the force is expended only upon that portion of the uterus designed to be manipulated, and, as is well known, the cervical portion of the uterus may be subjected to surgical treatment with comparatively little danger. The needle to be used should be without cutting edges, and should be passed directly through the firm tissue of the cervix.

When one size of the dilator has served its purpose, it is readily detached and replaced by a larger, until the desired dilatation has been accomplished. A moment's reflection will teach that which at first surprised me, viz., that the cervical portion is elongated and thinned by tension from above downward, in ratio corresponding to its dilatation. This produces a more radical change in its condition than that resulting from dilatation with tents, and for certain conditions, *e. g*, a sharp anteflexion, with stenosis, gives a manifest advantage. I am under obligation to Messrs. Codman & Shurtleff, of Boston, for painstaking care in perfecting the instrument as here presented, and allow me its commendation to you for trial and criticism.

ON THE TREATMENT OF FIBROIDS OF THE UTERUS BY MEANS OF DRY EARTH.

WITH OUTLINE TRACINGS OF THREE CASES SO TREATED IN THEIR VARIOUS STAGES OF PROGRESS.

By ADDINELL HEWSON, Sr., A.M., M.D.,

PHILADELPHIA, PA.

GENTLEMEN:—

I must first acknowledge the compliment paid to me, and which I highly prize, namely, that of having been asked to make this address before you to-day. As many of you are aware, I have been for more than twelve years most zealously engaged in studying the "Uses of Earth in Surgery." All of the work involved in such study has been done under the bans of ridicule, of malice, and, if *worse*, of assertions of unsoundness of mind, and that, too, by men in the profession who knew such to be untrue. Thank God! I have not only outlived such villany, but can even boast of having been well rewarded in my successes of the treatment in the single subject on which I shall have the honor to address you to-day.

Some eight years ago I was, one morning, in the south of France, and whilst eating my breakfast was commenting on the public spirit of the famous resort in which we then were, on its having a daily paper with a list of the most recent arrivals at its hotels. I had scarcely uttered my remark, when the waiter presented me with a telegram, the direction of which, for me, was correct in every detail. I exclaimed, "why even this is better than what I get at home! They have spelt all my name right!" I immediately opened the message, and to my utter surprise it was from one of the most famous anatomists of America. It was, to come cut his thigh off—he was then over ten miles away from me. I hastened without delay, as I would to any stranger in a strange land who I knew was such a sufferer, as he must be from the wording of his summons. I, how-

ever, had nothing to take with me but my pocket-case and a pound of prepared clayey earth. Such, indeed, had often been my only resources when caught away from home on this side of the Atlantic, travelling, as then, for rest and recreation.

I was not long in reaching the doctor, and in determining his condition, and what was to be done for him. He had an open, suppurating knee-joint of the right side, which had evidently been fully laid open on each side of the patella by the hands of a skilful surgeon. Such an operation, he told me, had been done by one of the best of American surgeons, and the same high authority had told him, some time previous to his leaving home for Europe, that if he should have another attack of suppuration in the joint like that for which he had made these free incisions, he should send to the nearest surgeon and have the limb removed above the knee. I examined it carefully, took into consideration all the details of the case, and then said, *candidly*, "My dear doctor! I am, like yourself, a stranger in a strange land, and have come promptly and honestly to you to see what I could do for you in my desolate state as to instruments. But," said I, further, "even if I had the necessary instruments I would not yet sacrifice that limb." "What!" he exclaimed, "would you still do?" I said I would make still another attempt to save it, and that by covering it with clean earth. "Ah!" said he, "that is just the thing I had in my mind when I telegraphed for you this morning after reading of your arrival in ———. I wanted to try the dry earth treatment." "Hurrah!" said I, "not only for Mother Earth, but for the public spirit of people in the place which sustains a lively enough paper to keep all advised of the most recent arrivals in it. If it had not been for that paper I would have been away in twenty-four hours' time, and *my* whereabouts afterwards discovered too late for *me* to do you any service." I went to work at once, and soon had the joint enveloped with the earth, and he was expressing himself, constantly, *delighted* with the relief it gave him before I got everything properly adjusted about him. The application of the earth was made in my usual manner, namely, that of filling the cavities and suppurating surfaces with clean, finely powdered clayey earth, and retaining this in place by strips of bandage two and a half inches wide, which were spread with a thick paste made of the earth and water. The layer of bandaging was made in the ordinary way of *strapping the knee*, and,

when dried, held everything intact. When I saw my patient the next morning, he reported that he had the best night's rest he had had for many a night, and that, too, without any of the anodynes he had been in the habit of using, and which I *tabooed* at my interview the day previous. He was delighted with the relief he had gotten. Each subsequent day he improved, and at the end of two weeks he was out of doors on *one* of his old crutches, free of pain or suffering of any kind, and confident of his radical cure being at hand.

He then (at the end of two weeks) stated that there was a lady in the town—an old patient of his—on whom he had made an explorative operation for ovariotomy some years previous. He had then made a section in the left side over nine inches long where he found a *multilocular fibroid* involving the uterus, ligaments, and deep pelvic tissues to such an extent as to render its removal absolutely impossible. There was nothing for him to do but to return the mass and close up the wound. Prior to doing this, however, he put the immense mass in scales and determined its weight, as accurately as he could under such circumstances, to be over thirty pounds. He then returned it into the abdomen and closed up the wound. The patient recovered from *this* operation, and then expressed her determination never to let the doctor be beyond her reach.

When he was sent to Europe she was constantly near him, always in the same town where he was. And now, from what she had seen from my treatment with him, she was sure I could cure her, and nothing would satisfy her until I had seen and examined her, and given her a positive opinion as regards this point. I was candid with her, and said one's prognoses in all such cases must always be guarded, but that if I could not make a cure of her I could give her some positive relief. Of this I was sure. For, from the effect observed immediately after the application of the earth dressing, I had learnt long since to make this as a positive promise, not always before or after the first application, but certainly within the time of the first five of them. If there was relief then, we might always look for that being positive and *permanent.*

She readily let me apply the dressing. It was a layer of the paste of clay over the abdomen, made to lay close by smearing it with a wooden spatula, and then retaining this layer in place by a series of bandage-strips well smeared on their inner side

with the paste of clay, and arranged on a broad board so as to overlap each other slightly, just as the scultitus is applied. This dressing of the clay I had originally made a full half inch thick, but soon had learned that a quarter of an inch was sufficient. My purpose of mixing it into a thick paste was to adopt the easiest way of applying it with security for its remaining *in situ* when it became dry. To increase this security I had in the earliest of my uses of the clay, or earth-dressings, resorted to the expedient of laying a piece of tarlatan gauze of loose texture on this layer of earth before applying the *retaining* bandage. This practice I have frequently continued, and have never found a better expedient for the purpose. The four years' experience and experimentation, which I had then gone through with, had taught me, also, that the efficiency of earth as a discutient agent was essentially due to the earth being *dry*, and in that state kept in complete contact with the cutaneous covering of the growth. To make it stick I have mixed it into a paste with water; the rapidity of this drying has been dependent, not only on the locality and the thinness of the application, but also on the intensity of the action almost immediately set up in the dressing. For here, as in every other previous case in which I had applied the earth, heat was quickly generated, so as to make such an increase of temperature readily perceptible in contrast with that of the mixture of clay and water in the bowl.

The details of the preparation, mode of applying, and direct effects of the earth-dressing, which were the same in this as in many other cases familiar to me at this time, must, however, be postponed until I have completed the details of this and some other cases which I think proper to introduce to you as illustrative of the earth's action on fibroids of the uterus.

Dr. ——'s patient the next day, the day after my first application of the earth-dressing, was relieved in every respect. She was not only relieved of pain, but diminished in size in every direction. My plan was to measure her by a tape measure around the chest at the xyphoid; three inches above the umbilicus; at the same; three inches below the same; and across from one anterior superior spinous process to the other. This was done with a strong, unyielding measure, drawn as tightly as possible. Such a method of measuring I have now abandoned for a more accurate one. Its use was, however, definite and accurate enough to show the changes occurring daily in her

case. My present plan of making measurements I will explain hereafter.

The patient's condition steadily improved from day to day, so that at the end of three weeks from my first application of the dressing she was reduced nearly one-half in size. She was full of life and spirits, declaring that she was going to desert her old doctor, and hang on to her *dirty one.* "Oh!" said I, "that won't do. I am no poacher, even in a foreign land. You are Dr. ——'s patient, and it is only with his consent that you will adopt any such plan." "I will make that all right," said she, "the doctor and I are old friends." "Very well," was my reply.

The next day the doctor came to me, and said, "Do let Mrs. —— join your party. You will be the means of curing her." "Very good," was my reply; "I will be most happy to do all I can towards such a result. But it was not to be done in her way without your approbation." "Take her, by all means," said he, "you have already been detained by the two of us over a month, and you must be getting impatient to be moving on with your family." I said, "Yes, it is high time I was moving. I have been here five weeks, but would not, except for the attraction of your cases, have staid here twenty-four hours. I am well satisfied with the relief I have given you both, and would not now be thinking of leaving you, except that I think you can take care of each other." "Oh, no," said he, "you are entitled to the credit in both our cases. Take her with you, and I will be most ready and the first to credit you with our cases."

My party started in a few days, the lady in the same train, and she was always for twelve weeks from the time I began her treatment constantly under my observation. We went through Switzerland, Austria, Prussia, Holland, and the north of France, reaching Paris the Monday of a week made famous by the assembling of a great medical congress there.

Reading over the list of arrivals to my patient, I came to the name of our mutual friend, the doctor; but I quickly said, "this is Dr. —— and *wife*, and it cannot be our doctor, for he was a widower when I left him." "Oh!" said she, "that is all right; you made such a good cure of him before leaving —— that he has got married again."

And so it was. I went immediately to see him, found him *well*, with the joint all closed, and free of osteal and periosteal

pains. His first inquiries were, as anticipated, about the lady. I said she was doing well, and had sent a message by me for him to invite all the great gynæcologists who had seen her with him, and were then in Paris, to come to see her with him on Wednesday. They all came, making a party of eleven. She was ready *in bed* to see them. They were marched in single file, surrounded the bed, and all made their bows, and, as it were with one voice, congratulated the patient on her looking so well. She did look wonderfully well, entirely free of that expression which she wore when I first saw her, and which is universally recognized as so characteristic of the sufferers from these tumors. They all, however, *immediately* cast their eyes to the locality of her tumor. This was done so *instantaneously* that her eyes and mine involuntarily met, and neither of us could restrain a smile. I at once invited the head of the party to examine the patient. He said: "Certainly, if it is the lady's wish." She exclaimed: "Oh, yes! I want you all to examine me." This great surgeon, famous in Paris for the gentleness of his manners, approached closer to the bed, and gently drew off the bed-covering. As he did so, she as quietly straightened out her limbs, which had been previously flexed high up, and removed from off her abdomen a pillow, and then there was no tumor visible. "My God!" said the great man, "what have you been doing here!" "Only practising a Yankee notion," was my answer.

Since then (1873) there has not been a year passed without my seeing or hearing of this lady as a perfect cure. It has certainly been not a mere coincidence or a want of previous care and treatment—she had been thoroughly explored. There was no mere phantom tumor—the doctor had once had it in his hands and found it to weigh over thirty pounds, and that, too, by actual weight. Had it undergone cure by a spontaneity of nature? Strange such did not begin before, and only manifested itself after the first earth dressing! The doubter, still more the denier of a cure here, is, I think, beyond being convinced. Is he to be satisfied by multiplying such cases? That I can now readily do. I can furnish the details of over fifty such cases which I have seen, and but one fatal case, made so by an intercurrent malady, the particulars of which I shall hereafter show were not merely accidental!

Such results must be consequent on what was done for the

cases, and that, too, after they came under my treatment. They had all been under previous treatment; they had all been examined and diagnosed by others; most of this number had been pronounced *incurable*, beyond the reach of the knife, and had tried the muriate of ammonia and the ergotine and hyposulphite treatment long enough to demonstrate that their cases were growing worse under them. No one can expect me to make a comparison of them with a like number of cases of a skilful ovariotomist. I cannot, indeed, follow to their results all those for whom I have chosen this treatment. Many of such have come from the country and have remained but a short time—a week, or ten days at the utmost—and having been quickly *relieved of pain* and feeling confident that they could pursue the treatment without me, have gone home. When they got there they were in a condition easily to be persuaded or ridiculed out of perseverance with it by their family doctor, who, knowing nothing about it, would argue that it was absurd in the very conception of the idea of using dirt to cure anything.

Many men in the profession, who were possessed of a little more courage and liberality than the above, or than those who relied on the *dictum* of their former teachers, have sought information of me, and in doing so, have shown how little they had endeavored to study the subject. One man, a doctor, wrote me a letter that he had tried the *dirt*, in the case of his wife, who had an intra-mural fibroid, but that she could not endure the effect of the *stones* in the *dirt* he had used with her over eight or ten hours. Was that man a competent judge of the value of dry earth in surgery? I think not.

A case of fibroid was once under my care some six weeks, and did not improve as rapidly as she thought she should; she was, however, doing well. She went home, consulted a surgeon on her way, and submitted to his plan, excision of the uterus and all. Forty-eight hours afterward her body was in the hands of the undertaker. Such a case is not to be considered as a fair test of the earth-treatment, whatever it may be as to excision of the uterus. I certainly have the right to ignore it, in making out a list of cases treated by my plan. We might as well saddle on the ovariotomist all the cases which seek his advice, but do not follow it by undergoing his operation.

But I must give some details of cases which I hope will convince the doubter of there being an action in earth of extraor-

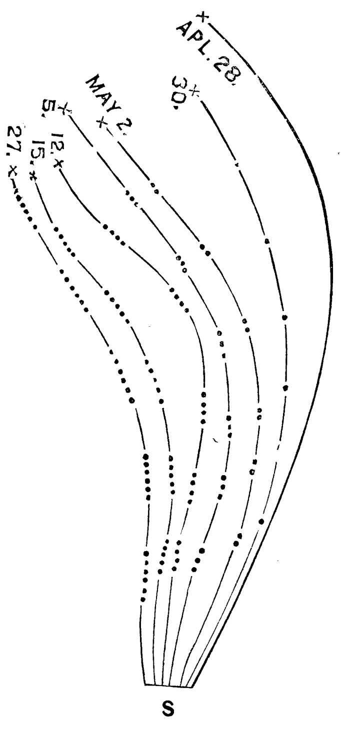
dinary value. I will here rely on my most recent experience; but before giving these details, I must explain my mode of securing the most essential points, the memoranda of the changes in the form and size of each growth. This I have recently done *effectually* by using a strip of sheet-lead, an inch wide, one-eighth or sixteenth of an inch thick, and about twenty or more inches long. This is a recognized means of making tracings. Drawing this quickly and several times through a folded towel, it becomes more flexible, and can readily be adapted to the contour of the patient; and after allowing it, when placed flat on the parts, a few minutes to get cooler, it is easily lifted up, and a tracing of its margin made on a strip of paper. Such tracings I make at each dressing, *always* from xiphoid to symphysis, and across from one anterior superior spine to the other. With these I have preserved accurate memoranda of sensational and other effects of the earth, and the histories of the cases.

With this preliminary point of the mode of preserving records of the changes in cases, from day to day, or a longer period of time being decided, I will pass to the reciting of a few cases, demonstrating more fully than I have done, the effect of the earth on their reduction in size.

Case I.—Mrs. H——, aged 40 years, noticed six years previous, when menstruating, a swelling on the right side of the median line; this was very painful. She had had but one child, then (when I saw her) fourteen years old; and although always regular after that birth, never was so without great pain. When I first saw her, she was a remarkably thick-set person, and looking as though she was near her time of delivery. Then she measured from xiphoid to symphysis full sixteen and a half inches, by a broad steel measure. The same measure, drawn as tightly as possible around her body at the xiphoid, yielded thirty-one inches; at three inches above the navel, thirty-four inches; at the navel, thirty-eight inches, and at three inches below the navel, thirty-six inches. The surface of the abdomen was very painful all over, but especially so in the region of the navel. She was suffering too acutely at this time (when I first saw her) to allow of any explorations per vaginam, or heavy palpations. I applied the dressing at once, and she said it was very pleasant and soothing. I forbade her taking any anodynes, to which she had been accustomed, and I

did not visit her for the purpose of removing the dressing until the end of forty-eight hours. She was then entirely free of pain, with the dressing so loose that I could pass my hand readily between it and the walls of the abdomen, and push it down below the navel. After peeling off all that was adherent of the dressing, and dusting off the surface—I never *wash* it off—I measured her for the effects of this first dressing, and got from xiphoid to symphysis, only thirteen and a half inches; absolutely three inches less than it was two days previous; at the waist, or three inches above the navel, there was the same reduction of three inches; at the navel, the reduction was four inches; whilst at the lowest point below the navel, previously taken, there was a reduction of but one inch. At the end of the next period of forty-eight hours, when I went to renew the dressing for the

Fig. 1.[1]



[1] This and all other figures represent accurately one-fourth the size of the originals.

second time, there was a similar reduction, as you can readily see from my tracing then taken. (See Fig. 1.) Now I could not only handle the abdomen, but knead it everywhere. There was no tenderness about it then; I could isolate a mass extending up the mesial line above the navel; it felt about the size of a child's head, and could be moved to either side; the sound in utero showed this to be growing from the fundus, and fixed closely to it.

The last tracing in this case, taken four weeks after the first, shows what intermediate effect the earth had had on the growth. The third and the fourth set, which you will notice are very close to each other, record the condition during the menstrual flux. This patient, as all I have treated, not only wore the dressing, but had it renewed, if it became detached during this period. Her freedom from pain was constant, and the flux not only healthier than formerly, but more abundant.

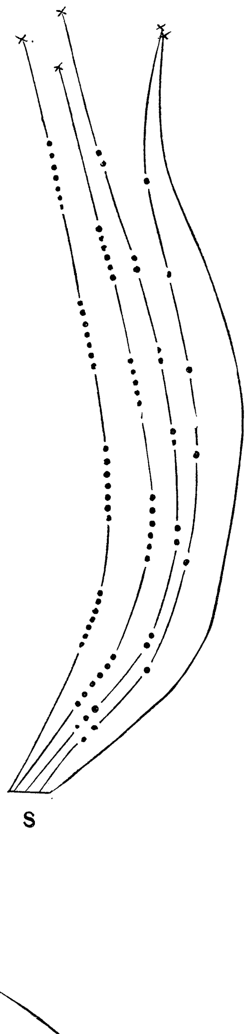
The next case I shall recite briefly is of interest, on account of the complication associated with the tumor, and which prevented its recognition until the tumor had been in existence some time.

Case II. Miss ———, æt. 28 years, a fair brunette, has been under treatment over eleven years by a specialist of great experience for curvature of the spine. She had always suffered much with her menstruation, which was always profuse and too frequent. The curvature of her spine, when detected at seventeen years of age, had been looked upon previously as a sequence of carelessness of carriage and stooping at school. It was a lateral curvature to the left in the upper dorsal region, with the usual projection of the base of the scapula there.

The treatment that had been adopted for this was essentially steel apparatus pressing on the crests of the ilia. Soon she complained of pain there on the right side. Then the doctor discovered some swelling in the abdomen, deep down, and to the right of the median line. This spot was always painful, but especially so when the time approached, or was actually present, for her menses. The pain with her menses had now much increased. The swelling each week was greater, and becoming evidently clearly connected with the womb. She was sent home to be treated by her family physician. After treatment there without benefit for some time, she one day heard of one of my patients, whom she went immediately to see, and then con-

cluded to come on and put herself under my care. This was at the date of the first tracing of Figs. 2 and 3, when I diagnosed an extra-mural fibroid growing from the right side of the uterus, firm in its attachment there, but free elsewhere. Her contour you can form an idea of as regards the abdomen by the continuous line of the diagram (Figs. 2 and 3). There you can see the effects of the earth in twenty-four hours by comparison of it (the continuous line) with that of the single dotted line. The reduction then across from one anterior superior process spent to the other was more marked than that vertically.

Fig. 2.



This patient was relieved in twenty-four hours of pain, and allowed me to manipulate and thoroughly examine her, so as to complete my diagnosis—that of three fibroids of the external walls of the uterus. The two prominent points on the vertical line and those on the transverse line indicate the site of these fibroids.

She remained in Philadelphia under my care just sixty-five days. During that time the dressing was renewed only seven times, for the reason that the patient was one who had had previously good training, and retained her dressing without difficulty.

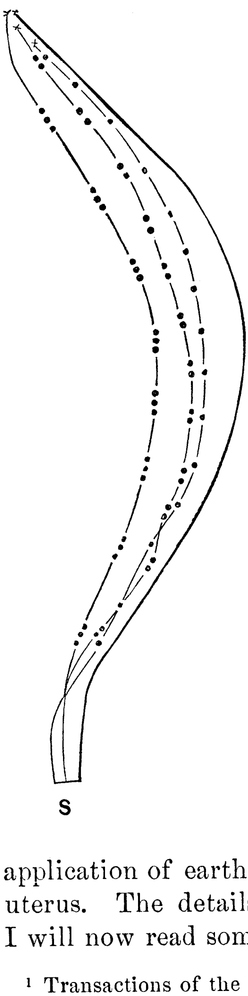
Fig. 3.

My purpose in all these cases is, as I have said before, to keep them covered as constantly as possible with an impervious coat of dry clayey earth.

At the end of the sixty-five days the line of the abdomen was quite natural in form, although not as even as in the other cases I have reported.

Here I will occupy a few moments in showing the facilities this method gives of studying the diagnosis of cases, and of preparing them for laparotomy, if such become imminently necessary. In Figs. 2 and 3, 4 and 5, and 6 and 7, as well as in Fig. 1, you can all see the immediate effect of the earth on the tumefaction, in its rapid removal of the cellular infiltration. This allows of better definition of the growth than the removal of tenderness allows of free palpation, and even of thorough reading and internal exploration. I have in these ways been able to determine a growth free of complication (which would be adverse to excision), or define its form accurately. Thus in Case (Figs. 2 and 3) No. 2, the distension was such on the first day, and the tenderness so great that I could not detect the presence of the three fibromas of the uterus, which were readily recognized after that day.

Fig. 4.



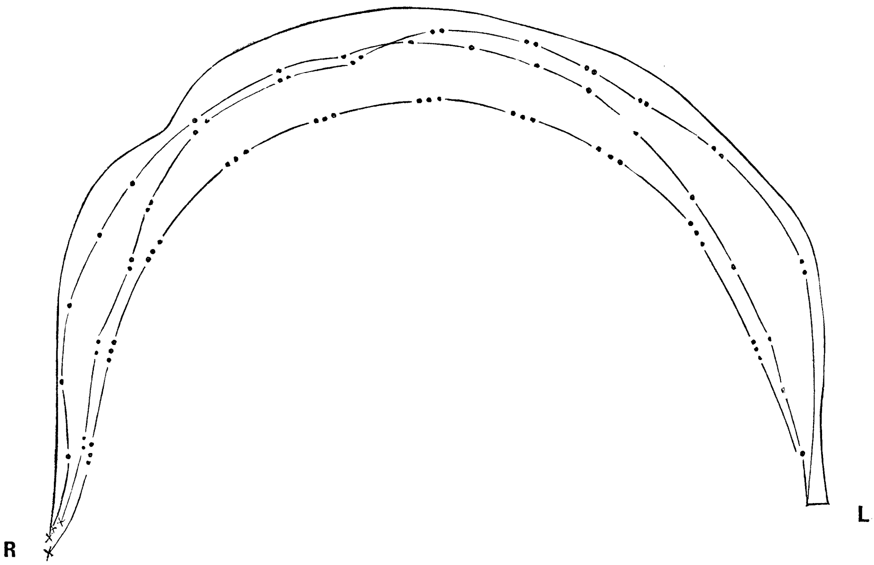
Case III. (Figs. 4 and 5).—In this case the retrocession was so uniform that the diagnosis of an ovarian cyst was quickly made and confirmed, and finally in Case IV. (Figs. 6 and 7), where there was a pendulous belly, I was as readily aided in my diagnosis.

I stated, awhile ago, that I have had but one opportunity of studying by post-mortem examination the effects of the application of earth over the abdomen on these growths of the uterus. The details of this case have been published before.[1] I will now read some abstracts of them.

[1] Transactions of the College of Physicians of Philadelphia. Third series, vol. iv. Read by me February 5, 1875.

"Miss ——, a tall blonde, had been suffering for six years prior to October, 1878, from a steadily growing tumor in her

Fig. 5.



abdomen, which was first detected after suppression of menses then, caused by bathing in the river on the second day of the flow. The suppression was attended by severe pains in the loins and inguinal regions. The pains and suppressions continued until I saw her. When first seen by me in October, 1878, her appetite was very good, and all her functions save menstruation healthy. She was very much emaciated in her limbs and face however. Four years prior to seeing me she had consulted a distinguished ovariotomist in New York City, who proposed operating on her at once, as he said she could not live over a month. Subsequently she placed herself under homœopathic care. The man tapped her in the left side, and got less than a tablespoonful of bloody fluid from the operation. When I first saw her she was propped up in bed suffering with much dyspnœa and exhaustion. The day she came to Philadelphia she was weighed whilst waiting at the depot. This showed that she had gained in weight during the past six years fully fifty-eight pounds, and that in spite of the emaciation of her limbs, chest, and face. Before starting on her journey to Philadelphia she

measured herself around at the navel, and her circumference there was fifty-four inches. The integuments covering her tumor were in this lower portion (from the umbilicus down) in a state of marked hypertrophy (like elephantiasis), and in singular contrast with the blue, attenuated skin above the umbilicus. This hypertrophied portion was weeping freely a watery fluid so constantly that it had been heretofore impossible to keep her dry or prevent itching and excoriation. The distension of this portion of the walls of the belly had indeed been such as to occasion a hernial protrusion in each groin. The whole projecting mass made it impossible for me to reach the vulvæ, whilst she was sitting up, by the full length of my forearm. Her vulvæ were occasionally infiltrated. The results of the first application of the clay were like those obtained from other cases which had proved successful. Her urine, which was examined on the second day, was found free of albumen, but loaded with phosphates. Deep explorations then showed fluid confined to a portion of the peritoneal cavity, with dulness, and feeble succussion the jelly-like movement of a fibro-cyst confined to the central portion of the body. By various changes of position, etc., of the patient I concluded then that I had a large fibro-cyst of the uterus with extensive adhesions to deal with. The patient improved steadily, with the dressing renewed every day, for the first week, and after that period the dressing was renewed every third or fourth day. At the end of the first two weeks all the major measurements (as can be seen by the accompanying table) had each diminished about 4 inches (some of them $3\frac{1}{2}$ and others $4\frac{3}{4}$). She was then walking about her room, sleeping comfortably on both sides, but most preferably on the left. She was then even dressing herself with a silk dress, which she had not before been able to make meet on her person for more than two years. At the end of three weeks of the treatment she went out and rode in a street car, not going very far however. This did her no harm. On the contrary, she measured (two days after it) much less.

At the end of the fourth week of her using the earth dressing, this lady had got to going out freely every day, generally walking on our chief streets for shopping, interested in the excitement of others who constitute the crowds on such streets. On one occasion she was so influenced as to protract her promenade beyond what was proper, and so caused a syncope on the

This table contains her measurements for over two months.

Date.	Circumferences at		Inches from Umbilicus to				Circumference three inches	
	Xiphoid.	Umbilicus.	Xiphoid.	Symphysis.	R. A. Spine.	L. A. Spine.	Above Umbilicus.	Below Umbilicus.
Oct. 21	36	48¾	12	17	16½	15	48¾	46
" 22	34½	47½	12	16	16	..	47¼	..
" 23	34	45½	12	15	15½	15	45½	45½
" 24	35	46	12	14½	15¼	14	46	45½
" 25	33	46	12	14½	14½	14	45	44¾
" 26	33	44	12	14	14¾	14¼	44	44¼
" 27	34	44¾	11½	16	14½	14	44½	44½
" 28	33½	44¾	11½	14	15	14½	43½	44
" 30	32½	42½	11	14	14	14¼	44	43½
Nov. 1	32¾	43¾	11	14	13	13	44	43½
" 4	32½	43¼	10¼	13½	14	14½	43	42½
" 8	32	44	9	12½	12½	13½	43	43
" 11	32	43	10½	14	13½	14	44½	44
" 14	33	43	10½	12½	13	13¾	43	43
" 18	32	42½	9¼	12½	13	13	42	42
" 21	31½	42	9½	13	12½	13	41	41¼
" 26	31½	43	9½	13	13	13½	41	41½
" 29	31½	42	9½	12½	12	13	40	42
Dec. 2	31½	42	9½	13	13	13	41½	42½
" 7	31	43	9	12	12½	13½	41	42
" 11	31	42½	10¼	13	13½	14	43	43
" 14	31	41½	9	12	12½	12¼	41	42
" 18	31½	41½	10	12	13	13	41	42
" 23	32	42	9½	12	13	13	41	42
" 26	32	41½	10	12	13	13	40	42
Jan. 21	32½	41½	10½	10	13½	14	42¼	42
" 27	31½	42	10	11½	12	13	41	41

street. From this she made but a slow recovery, evincing the effects of heart clot; and before they disappeared, a colliquative diarrhœa set in, which caused her death on February 1st, from exhaustion.

Post-mortem revealed no recent effects of inflammatory action in the peritoneum, but numerous extensive adhesions. The tumor was of a fibro-cystic character. It had a firm, jelly-like feeling when handled, and showed numerous rounded projections. It was connected by a short flat pedicle to the fundus of the uterus, and adherent to the abdominal walls on the left of the median line. The womb itself was slightly elongated; a probe passed in its cavity over three inches, a vertical section of the organ showed its peritoneal covering to be thickened and roughened on its serous side, with one or two firm fibroids in contact with the womb. A section of the tumor proper showed

it to be sub-peritoneal, with a thick firm capsule, and the pro jections, especially on its anterior portion, were partly collapsed, containing a tremulous jelly-like fluid; those which deserved to be distinctly termed cysts varied in size from one to two inches in diameter, down to the size of a pea; none of them contained a positively watery fluid. Many were like shrivelled fibroids. Various sections made through the tumor presented the appearance of a low grade of sponge, with various sized cavities, some filled with solid matter, others empty.

A microscopic examination made by Dr. Morris Longstreth, the microscopist of the Pennsylvania Hospital, showed, in a band of fibrous tissue from the periphery of a cyst of the growth, fibrillæ closely felted, with a few nuclear bodies between them; then, at another point of the same cyst, the fibrillæ appeared swollen and more separated, with greater infiltration of nuclei; and at another point the fibroid tissue was at a minimum; the fibrillæ were widely separated, with the intervening spaces filled with a nearly transparent mucoid-looking fluid.

"A microscopic examination of the firmer parts of the tumor showed, in only very limited areas, an appearance typical of fibroid structure, but still sufficient to establish the undoubted nature of the growth. In general, the picture presented was of short tracts of fibres, of almost a purely fibrous character, ending abruptly sometimes, or sometimes fading out or lost in tissue quite transparent and homogeneous, in which rarely a fibre was distinguishable." In some areas a nearly complete myxomatous degeneration had taken place. This was still more evident in the contents of the larger cysts.

Dr. Longstreth concluded his report by the expressions "*Anatomical Diagnosis.* Fibroma of the uterus undergoing cystic degeneration."

This is what would seem to be, from my experience, the *mode of cure* set up by the continued use of the earth applications, a most positive imitation of the way in which nature effects such *sometimes.* The great frequency of such cures occurring after a prolonged use of this treatment show I think, beyond all doubt, that those results are directly due to it. If time would allow, I could readily adduce further demonstrations of cures than those already brought forward; but I must pass to the consideration of the earth itself, the best kind, its mode of prepara-

tion and application, its points of essential value to those of my hearers who are desirous of trying the treatment.

1st. As to the earth itself. My experiments have included all kinds of earth. I soon learned, however, from such experiments, that the virtue of healing the flesh and that of disintegrating and dissipating morbid products in the flesh, were essentially due to the clayey element—the *double silicate of alumina;* and that the efficiency of this was materially influenced by the state of its ferruginous elements. A clay recently exhumed, and having been exposed to the light and air for but a short time, always was more efficient than one exposed for a long time. So a strata of clay of a light yellow color proved itself far more active than one either of red, blue, or putty color. The pipe clay or the potter's clay are inefficient, and have always shown themselves too strongly alkaline. It is important to get a clayey earth free of grit or sand, for the opposite kind of earth cannot form an impervious cover, and will not hold firmly to the parts. For all these reasons, I have for a long time had prepared a clean article of yellow clayey earth, which, by tasting, can easily be determined to be free of foreign matter. The strata of clay used for making the best red brick furnishes from its uppermost extremity—that immediately below the soil—the best article I have ever been able to find. If one will take some from this region and compare it with that from the lower end of the strata, where it is in direct contact generally with gravel, the difference I am pointing out will readily be recognized. The former will also be found cleaner, more tenacious, and capable of drying more readily when it is wet than the latter, and it will adhere more firmly when well applied to the flesh.

2d. So much for the kind of earth I am in the habit of using, and the reasons for its preference. I will now detail the mode of preparation to which I have it subjected—this is one essentially of cleansing. I have it collected in masses or large pieces and kept in that state, in an open box and in a dry place to prevent its becoming mouldy, covering the box with a thin texture to keep out insects. When about to use it, I have it dried on a board in the sun, crushing it then into small pieces so as to facilitate its drying; it is then rolled between a slab of smooth stone—a piece of marble or the like—and a glass bottle, making the bottle do the rolling; all grit or pieces of foreign matter will then be detected at the first rolling and be removed by

hand or sifting; another rolling will reduce it to a perfectly fine powder, which is to be passed once or twice through a fine flour sieve. The necessity for these last siftings being repeated will depend much upon the weather, a damp day making the particles adhere to each other more than they would on a clear, dry one. This powder I have put in clean boxes on a lining of bibulous white paper—if the boxes are wooden—or in glass jars of a size to hold a single dressing, and closed by an air-tight cover. Samples of the jars and earth in them were here exhibited. A single dressing of an abdominal tumor requires about one pound of this earth. As I have had positive proof that a recently pulverized article of earth is more active than one so prepared for a long time, I have always been in the habit of having it got fresh in lumps, dried, and then pulverized as I was likely to need it, keeping a good stock on hand always in lumps in a dry place. I am thus sure against its getting mouldy or musty.

Finally. As to the mode of making this dressing. It consists essentially in applying the earth in such a manner as to make it adhere in a *dry state* as long as possible, and, at the same time, making an impervious covering from the air to the parts immediately over the growth. Here I have resorted to numerous expedients, but have found the simplest and the best to be that of mixing, for one dressing, about one pound of the powdered earth, with water in a bowl, by the aid of a wooden spatula, made on the occasion out of a clean piece of wood, with one's pocket-knife. This mixing is best made in a deep, wide bowl, and by whipping with the spatula rapidly, so as to get it into a perfectly smooth paste of such thickness as will allow its being easily smeared over the parts to the depth of one-eighth to a quarter of an inch everywhere, save on the margins of the dressing, where it should be as thin as possible, so as to favor its being retained the longest time. I always insist on this application being made *directly* on the skin, and that, too, without any preliminary washing, especially one with soap. Immediately on this layer having been made, I apply either a sheet of thin tissue-paper, some tarlatan gauze, or very thin cotton wadding directly to it, and favor their becoming imbedded in the clay, by passing my hands over the texture several times, in a way to smooth it down into the earth. By this time the surgeon will become aware of a marked increase of temperature in the earth; the patient herself may remark the fact, and will usually state

that her pain is becoming less; that her diminution of pain will steadily go on, reminding one of his school-boy experience of the effect of *mud* in allaying the pains of the bee stings which he had got from his meddling with that industrious little insect.

When the layer of tissue has been applied, a many-tailed bandage—with a gore on its back part to make it fit closely there—is to be put on for the purpose of retaining all the application in place and so completing the dressing. This bandage should be secured only so tight as to give good support to the clay in every direction.

All of this dressing should be made with the patient in her night-gown and flat on her back in the bed. There she should remain quiet for three or four hours to let the earth dry and become firm in its place, when she may be allowed to get up and move about. The first dressing should be made in the forenoon, and, owing to the rapid absorption of fluid in the tissues, calculations are to be made for its removal the next day. The surgeon will then find that his patient has passed a good night, and that, too, without any anodyne even, if she has been in the habit of their use, and in a condition remarkably free of pain. The shrinkage from absorption of the fluid in the cellular tissue will quickly demonstrate the necessity for a new dressing. The old one is to be removed by peeling it off in *its dry state;* a resort to water here, once, will satisfy any one that this injunction should never be disregarded. In its dry state the clay can be easily detached from the surface of the skin by gentle handling with the spatula, and made to come off far more *readily* and *completely* than by any means where water is used. The dry surface now exposed is ready for measurement, and tracing can readily be made of it by the broad tape of sheet lead, which can be preserved on a sheet of paper on which the subsequent tracings are to be preserved.

After one, two, or three daily dressings, made according to the exigencies of each individual case, it will cease to be necessary to make them so frequently; the rule here must be the amount of shrinkage each day—or any specific period of time. The virtue of the earth applications has been shown, according to my experience, to be dependent essentially on the complete contact of such a layer of earth in its dry state with the diseased part, so as to thoroughly exclude the air from such parts. The rule must then be to renew such only when it is not so closely

adherent to the surface as when first applied. The renewal of the dressing must, however, not be made too frequently; we want its contact with the diseased surface or the surface covering the diseased part as constantly and as perfectly in the dry state of the earth as possible. This is, according to my notion, only to be determined by personal inspection every twenty-four hours; if the dressing is then dry, and firmly adherent all round in every direction, let it alone. If it should be wet in the groin or over the pubes—as may happen in hot weather—remove only those portions and replace them by fresh. This is not likely often to occur, unless with patients of marked obesity. Where you have a very large tumor in a thin patient the reduction will be so positive the second day as to enable you to pass your hand under the upper border of this first dressing; then it has all to be removed and reapplied. And remember here, that this removal is all to be accomplished by peeling it off with the spatula or the handle of a spoon, so as to preserve the surface in as dry a state as possible; anyway, by using water one only retards the cure—of this I am very certain. It is the earth in its dry state that has proved the efficient agent, hence I exclude all other use of water than that absolutely required in making its contact complete with the surface. The second and all subsequent dressings are to be made like the first—and are to be disturbed like that—only when they have ceased to afford a perfectly impervious covering to the surface covering the growth. Hence, in my experience, it is imperative for the surgeon to watch the case and make the dressings constantly for a period of three or four weeks, when the patient may have then become so familiar with all the details as to be able, with the aid of some devoted friend or attendant, to make them perfectly herself. Then she will not need the surgeon's care so constantly. His visits once a week may be sufficient, or she may go home, if it is remote, and pursue the treatment without him. The best and quickest cures are, however, always to be obtained where the patient remains faithfully under the care of one who understands his work and perseveres in it.

STILLBIRTH—RESUSCITATION AFTER TWO HOURS AND FIVE MINUTES.

By ROBERT BATTEY, M.D.,

GEORGIA.

Mrs. W., aged thirty-five, three years married, primipara, medium stature, very fleshy, in excellent general health, and at full term, was aroused at midnight on Wednesday by very slight uterine pain and copious discharge of liquor amnii. She was seen at 6 A. M. Thursday. The waters were still draining away at intervals and freely; there was, however, no pain, and had not been since the first discharge, but only a "sense of discomfort," as she expressed it, in the pelvis. The os was open to the size of a silver quarter dollar, and very high up, so as to be difficult to reach. The presentation could not be made out satisfactorily. The next twenty-four hours were passed in comparative comfort; little or no pain was complained of, and labor did not progress at all, although the waters continued to be discharged at intervals. At 9 A. M. of Friday (thirty-three hours) the os was slowly dilating, the uterus had settled down in the pelvis, and a female child was discovered to be presenting by the breech, with the sacrum to the right acetabulum.

The labor went on slowly, pains moderate and well borne. The breech and abdomen of the child came lazily through the vulva, when, at 3 P. M., the pains having ceased, the arms were brought down, and the head turned out of the vagina with some delay and great difficulty, because of the obesity of the mother. The child was *still* and deeply cyanosed, the cord was pulseless, the heart-beat was very feeble and irregular, there was no effort at respiration. By the old mouth to mouth method the lungs were inflated without loss of time, the mouth and throat of the child having been previously cleared of mucus. A spray of cold water was repeatedly dashed in the face and upon the chest, but not the slightest respiratory movement could be elicited. Artificial respiration was attempted successively by the several

methods of Marshall Hall, Sylvester and Harvey Byrd, and continued for fifteen minutes, but the trachea and larger bronchii were so clogged with mucus that the air could not be made to enter the lungs satisfactorily by either of these methods.

The surface of the body was now becoming quite cool and livid; there was no respiratory impulse whatever, and the heart-beat had not been perceptible at all for some minutes. The child seemed to be entirely and hopelessly dead, and would have been so pronounced had not repeated experience shown the successful resuscitation of stillborn babes after a much greater lapse of time, and under circumstances apparently the most hopeless. A nurse was deputed to surround the body and limbs of the child with hot flannels, and change them every four or five minutes so as to maintain an excessive surface temperature, whilst the attention of the writer was directed to the complete and rhythmical inflation of the lungs, mouth to mouth, the nose of the child being compressed between thumb and finger.

In ten minutes' time the pulsations of the heart could be feebly discerned, but they were extremely slow, not more than ten or twelve to the minute. The pulsations, however, increased gradually in frequency and force, until, after the lapse of an hour, a fair normal standard of circulation was reached. The aëration of the blood by the artificial inflation of the lungs had progressed so favorably that the face and head were assuming comparatively a natural, florid color, though the ears, lips, and limbs were still quite livid. Now, for the first time, a single deep breath was drawn, and in ten minutes more another. The inflation by the mouth was diligently continued, the mucus rattling loudly in the air-passages all the while, portions of it being forced up into the nasal passage by the inflation, and expelled from time to time from the nose during artificial expiration. The long interval between the natural breaths gradually shortened, until the respiration becoming two per minute the inflation by the mouth was discontinued, and, finally, after the lapse of *two hours and five minutes* by the watch the breathing became regular and rhythmical. In fifteen minutes more the aëration of the blood was complete, the lividity was all gone, and the surface presented only the intense redness produced by the diligent application of the heated flannels.

The cord was now ligatured and divided. The child was well anointed with lard and wrapped in warm flannels, and was

allowed to rest without further toilet. It moaned at intervals as if in distress, but the action of the heart and lungs was normal. It nursed the mother repeatedly, took catnep tea, and slept fairly well. At midnight, however, the respiration became embarrassed with bronchial mucus, which accumulated more and more, and, finally, a pinkish sanguinolent froth issuing from the mouth and nostrils, the child died in asphyxia at one A. M. of Saturday, ten hours from its birth.

This case is brought before the Section, not on account of any novelty in the asphyxia or its treatment, but simply in the belief that it teaches a practical lesson of value which is not so generally accepted by the profession as it ought to be, namely, a lesson of patience and long perseverance in the use of means of resuscitation in the stillborn.

It is true that our standard authorities all enjoin the use of means to this end, and some even go so far as to inculcate maxims of patient perseverance; but none, as far as opportunity for reference at command of this writer is concerned, hold out any confident hopes of success when the heart has ceased to beat, and after so long a period as two hours has elapsed.

Dr. Tyler Smith, in his work upon Obstetrics, says: "It is seldom that a child can be restored after the cessation of these centric movements—gasping—notwithstanding that the heart will frequently beat for some time after they have ceased. . . . Artificial respiration is not of so much value in congenital as in other forms of asphyxia, from the fact that the fœtal lung has never been distended with air."

Cazeaux says: "The lapse of half an hour, an hour, or even more, from the time of delivery, is not sufficient cause for despair, since a number of facts may be mentioned going to prove that children have been in an asphyxiated condition for an hour, and were afterwards restored to life. Long-continued silence of the heart, the entire absence of pulsations at the præcordial region, frequently determined at intervals, is the only sign which can be regarded as destructive of all hope. The heart is the *ultimum moriens*, and I do not believe that efforts to restore its pulsations, whenever once completely extinguished, have ever been crowned with success."

Ellis, in his Manual of the Diseases of Children, quotes the statement of Maschka: "An infant may be an hour or more

without breathing, and still be saved." Bedford, in his Clinical Lectures, says: "Permit me here to remark that the faculty of resisting asphyxia, that is, of living without breathing, is very much greater in the new-born infant than in the adult, so that if a child should not breathe for half an hour or more after birth, it should not be abandoned as dead and beyond remedy. Cases are recorded in which resuscitation has been accomplished by some of the means just alluded to, and more particularly artificial respiration, even after asphyxia had continued for a long time. Another important fact is this: a newly-born infant affected with asphyxia should not be considered dead because its heart has ceased altogether to beat; for it has been demonstrated by Brachet of Lyons, Josat, and others, that life may be restored after the pulsations of the heart have ceased for more than five minutes."

Playfair, in his late work upon Midwifery, says: "In other cases the child, instead of being turgid and livid in the face, is pale, with flaccid limbs, and no appreciable cardiac action; then the prognosis is much more unfavorable. . . . Encouragement to persevere in our endeavors to resuscitate the child may be derived from the numerous authenticated instances of success after the lapse of a considerable time, even an hour or more."

In Smith on Diseases of Infancy and Childhood, we find the following: "The action of the heart, previously slow, becomes quicker by the artificial respiration, and I am confident that I have been able to produce pulsations by this method, when the heart had ceased to beat, and death, to all appearance, had occurred. . . . Artificial respiration should be continued for ten or fifteen minutes, in cases in which no action of the heart can be detected, by pressing the fingers under the ribs, when, if there are no signs of returning animation, the case is hopeless. . . . In one case, in which pulsations in the cord had ceased from ten to fifteen minutes before birth, in consequence of its prolapse, I employed artificial respiration nearly a quarter of an hour before there was any appreciable pulsation, but by perseverance the child was restored."

Dr. Condie, in his work upon the Diseases of Children, tells us: "In those cases in which the child is born without any indications of life, its face swollen and livid, its body flaccid, and no pulsation is perceptible in the cord or at the heart, notwithstanding there is but little hope that resuscitation can be

effected, it is nevertheless proper that suitable efforts should be made and persevered in during a reasonable time for the establishment of respiration. . . . In no case of asphyxia in a new-born infant should we hastily pronounce success impossible. . . . It is, indeed, amazing the length of time that new-born infants can survive without breathing, not merely for half an hour or an hour; but, as Dr. Maschka has shown, for a much longer period, even under circumstances the most unfavorable. A series of cases in proof of this are collected in the *Gazette Hebdomadaire* for December 1, 1854."

In the January, 1860, number of the *American Journal of the Medical Sciences*, Dr. Condie, in a highly commendatory notice of a lecture on Suspended Fœtal Animation, delivered in University Medical College by Dr. T. Gaillard Thomas, of New York, remarks: "According to the lecturer, when, in cases of stillbirth from asphyxia, there is no perceptible action of the heart, little or no hope of resuscitation is to be entertained. This is not our experience; we have known entire recovery to ensue in a very large number of instances, when proper measures have been promptly resorted to, and sufficiently long persevered in, when not the slightest action of the heart could be detected."

In the present instance, the results obtained might at first sight appear barren and unprofitable, inasmuch as the child had sustained such vital injuries as to cause death in ten hours, notwithstanding the resuscitation. Such a view, however, seems hasty and ill-judged. The fact that the resuscitation was successful in such unpromising circumstances should but give us the more courage and determination in those cases where less serious injuries have occurred. Besides, who shall estimate the value to the mother of the consciousness of a maternal triumph in having borne a living instead of a dead child, though she may be called upon to part with it in a few short hours? She is enabled to recognize it truly as her offspring; to feel that it is indeed and in truth a living soul; to fasten her affections upon it; to fold it to her bosom; to nurse it from her breast. If her faith so dictate, she may call in the priestly offices, too, have it baptized, received into the fold of her church, and thus made fit for heaven, where she may hope to set it as a jewel in her crown for all eternity. Surely these are abundant recompenses for our diligent endeavors, and ought to stimulate us to adopt fully the motto *nil desperandum*.

MINUTES OF THE SECTION

ON

OPHTHALMOLOGY, OTOLOGY, AND LARYNGOLOGY.

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TUESDAY, June 1, 1880.

DR. LAURENCE TURNBULL, of Pennsylvania, temporary Chairman.

Dr. W. H. DALY, of Pennsylvania, read a paper on *A Case of Syphilitic Stenosis of the Larynx, etc.* Two photographs, taken before and after the tracheotomy, show the comparative condition of patient. Paper referred.

Dr. CARL SEILER, of Pennsylvania, read a paper entitled *Remarks on the Lesions of the Larynx in Pulmonary Phthisis.* Paper referred.

Dr. H. KNAPP, of New York, made extensive remarks on *Tumors of the Lachrymal Gland, their Pathology and Treatment, with Demonstrations.*

Dr. CHAS. KIPP, of New Jersey, showed two photographs of a woman, taken before and after removal of a tumor, which was an ordinary adenoma, consisting of cartilage cells, epithelial cells, and tubes containing gelatinous masses. Case was looked upon as tumor of lachrymal gland.

Dr. SEGUIN read a paper, which was referred.

WEDNESDAY, June 2, 1880.

Dr. DALY, of Pennsylvania, read a paper entitled *The Thera peutic Value of the Galvano-Cautery in Diseases of the Naso-Pharynx.* Referred.

Dr. H. KNAPP, of New York, demonstrated, with models, *The Refraction of Light by Asymmetrical Surfaces.*

Dr. EUGENE SMITH presented an enucleated eye, in which there was a peculiar bone formation in the place of the lens, and which looks as if it *is* bony degeneration of the lens.

Dr. S. J. Jones, of Illinois, read a paper on *The Introduction of Liquids into Eustachian Tubes and Middle Ear.* After a lengthy discussion, the paper was referred.

Dr. E. Gruening read a paper on *The Preservation of Eyes in Wickersheimer's Fluid.* The doctor showed specimens so preserved in which the refractive media were perfectly transparent after the specimen had lain in the fluid three months.

Thursday, June 3, 1880.

Dr. B. Joy Jeffries, of Massachusetts, spoke at length on *Color Blindness.*

Dr. David Hunt spoke on *Variability of the Human Eye*, and exhibited plates and microscopic sections showing the embryology of the eye.

Dr. R. C. Brandeis, of New York, read a paper on *The Probable Cause of some Forms of Globus Hystericus.*

Dr. E. Gruening, of New York, exhibited a magnet for the removal of particles of steel and iron from the interior of the eye.

Dr. H. Knapp showed a case of, and made remarks on, *Perichondritis Auriculæ.*

Dr. T. R. Pooley, of New York, read a paper entitled *On the Detection of the Presence and Location of Pieces of Steel and Iron in the Eye, by the Indication of a Magnetic Needle.*

A lively discussion followed by Drs. Gruening and Pooley.

Dr. S. D. Risley, of Pennsylvania, read a report on cases of *Ear Troubles*, and showed photographs of a typical dermoid tumor of the cornea.

Dr. D. H. Goodwillie, of New York, read a paper on *Erectile Tumors of the Turbinated Bones.*

Dr. E. S. Peck, of New York, presented a case of *Primary Lupus of the Conjunctiva.*

Dr. Turnbull, of Pennsylvania, read by title a paper entitled *Observations, with Cases of Aural and Auditory Vertigo.* Referred.

Dr. Halcombe, of New York, read several papers by title, but did not submit them.

EUGENE SMITH, M.D.,
Secretary.

A CASE OF SYPHILITIC STENOSIS OF THE LARYNX, WITH FIBROUS ADHESIVE BANDS OF THE TRUE VOCAL CORDS: TRACHEOTOMY, RUPTURE OF BANDS, AND CURE OF STENOSIS BY GENERAL AND LOCAL TREATMENT.

By W. H. DALY, M.D.,

Senior Physician to the Western Pennsylvania Hospital, Physician for Diseases of Throat and Chest to the Pittsburgh Dispensary.

My advice was sought on October 8, 1879, for asthma by Mr. L. V., æt. 26, married, a livery stable proprietor. The following history, given with semi-aphonic raucity of voice, with some of the points expressed more fully by his wife, was substantially as follows:—

He had suffered for the past five weeks with what was pronounced asthma by his physician, and so regarded by himself. He had been under medical treatment during this time without benefit—indeed, quite the contrary. His dyspnœa had grown steadily worse, without intermission. He had suffered from a similar attack nine months before, which, though not so severe, lasted from three to four months, recovery following. He was able to lie down, and sleep, during the former attack, but a sense of suffocation has prevented him altogether from lying down during the past five weeks. Both attacks followed taking cold. He is much distressed for want of rest and sleep, a sense of suffocation coming upon him if for a moment he relaxes his efforts to get breath by means of aid rendered by the voluntary muscles. Dismissing his wife for a few minutes' private conversation with the patient, I learned that seven years ago he had a venereal sore on the penis. This he described as being a "little larger than a pin's head," and healing rapidly. It was followed by non-suppurating buboes in each groin, within a period of four to five weeks. Under the professional care of his physician these were cured, and his health continuing good, he had long since ceased to think of his experience with venereal disease, or

even to suspect that any trouble could befall him from that cause. His wife gave birth to a stillborn child, after eight months' pregnancy, in an easy labor about three and a half years ago. Her health, though not robust, is fair.

General examination.—This being the history elicited from the patient, I proceeded to an examination of his case. His efforts at breathing are now most urgent, and distressing to look upon; skin cold and clammy, and of a dusky hue, from non-aërated blood in the dermic capillaries. The *pomum Adami* rises and falls at each respiratory act fully one and three-fourths of an inch. Externally, upon the right alæ of the thyroid cartilage, and over its full extent is a diffused and elevated pinkish-red patch, which is tender to pressure. The duration of the inspiration as compared with the expiration is as one to three, the latter being difficult, and aided by the voluntary muscles. There is syphilodermata upon the abdomen of a tinea versicolor type, but of a brownish-copper color, and a gummatous node-like growth two and a half inches in diameter in the aponeurotic tissue of the linea alba just below the umbilicus. There is an irregular cribriform ulcer about two and a half inches in diameter upon the left scapular region, which is half an inch in depth in some of its parts, and with ragged and undermined edges.

The patient is a mere skeleton and much broken down, though he has a fine shapely frame, and must have been of good physique. His countenance is anxious and beseeching; large beads of sweat are upon his brow and temples; the angles of his mouth are retracted and depressed. The respiration is entirely through the mouth. His tongue is dry and denuded of its epithelium from the full width at the tip down to a point just in front of the circumvallate papillæ. The chest is full and round, characteristic of emphysema.

Apparently the difficulty in expelling the quantity of residual air from the lungs is as though the obstruction is acting like a valve, permitting ingress of air, but obstructing its egress. This causes the patient to voluntarily compress the chest by stooping forward at each expiration, while the inspirations are quick, short, and jerking. Upon the clavicle of either side there is a slight irregularity of surface, but no tenderness. Upon the tibia of right side, at upper third, I find a node three inches in length, and fully one-fourth of an inch high, which is quite hard. This node has grown within three months and has not been attended

with much nocturnal pain. Upon the left tibia at upper third there is also a node two inches long and one-third of an inch high, which has grown within the same period as the one on the other tibia.

A *laryngoscopical examination* reveals an epiglottis which is abruptly arched laterally, and much thickened. It is immovable by the respiratory act, and rather overhanging. An image of the subjacent parts within the larynx is obtained, and recorded as follows: There is serious encroachment upon the calibre of the glottis, and the rima glottidis is a mere chink, about one-third of the extent of the vocal cords in length, and in expiration of a breadth equal to the thickness of writing paper. During inspiration the separation of the vocal cords is slightly greater by a laxity, and sagging downward of their middle portion, there being evidently but little hyperplasia beneath them. But in expiration they are pressed upwards against the overhanging growths upon the ventricular bands, forming an almost completely closed valve. The hyperplastic encroachment upon the calibre of the larynx is greatest upon the right side of the thyroid cartilage, and extends downward. It obliterates the ventricles and ventricular bands, and pushes out the vocal cords which are adherent by a web of organized plasma to a little more than one-fourth of their extent from the anterior commissure.

The posterior commissure is obliterated by the vocal cords overlapping one another rather loosely, in a line to the left of the middle, and are there adherent also by a band of fibrous tissue in one-third of their length. The shortening and thickening of the aryepiglottic folds have occasioned the extreme bilateral arching of the epiglottis; they have also given the entire opening into the larynx more the appearance of a thickened rim of a truncated tube. The anatomical landmarks are obliterated, leaving a rather oval opening, which shades off into a mere fissure, with the bottom formed by the vocal cords, where there is a small slit, through which all the respiration the patient is capable of is carried on.

The color of the epiglottis arytenoids and aryepiglottic folds is of a grayish or leaden hue. The parts within the larynx, including the vocal cords, are all of a continuous dark India red color, and it is only with phonation in which the vibratory action of the cords is coarse and uncertain, that they could at all be distinguished from the irregular surface above them.

The patient was admonished that tracheotomy would in all probability have to be performed, and he was at once placed upon active antisyphilitic treatment, consisting of ten drops of the compound liquor of iodine every three hours, and six grains of Dover's powder upon a full stomach three times a day, cold, damp napkins applied to the throat, and inhalations of iodine vapor three times a day.

Three days later the occlusion had become so distressing as to impel the patient to send for me to "come and perform tracheotomy right away; that he would rather die than suffer another hour in such agony." I made the operation within the next two hours, being kindly assisted by Dr. Jas. McCann, T. J. Gallagher, Wm. Wallace, and J. C. Rea, of Pittsburgh. Less than a half ounce of blood was lost. No anæsthetic was administered, owing to the extreme cyanosis of the patient. (See Plates I. and II., taken two months after the tracheotomy, but previous to removal of adhesive bands of the vital cords.)

In three days after the operation the stenosis was perfectly air-tight, and the chondritis and perichondritis of the right alæ of the thyroid cartilage were increasing. A tumor presented externally over the right alæ of the thyroid cartilage the size of a hen's egg with a coppery red apex.

This subsided gradually, and the patient, being able to lie down, sleep comfortably, and take nourishment freely, in twelve days was able to come to my office for treatment.

The hyperplasia gradually subsided during the six following weeks. Then, from exposure to cold, the patient having been driving a carriage during the coldest weather either day or night, his neck merely muffled with a comforter, the parts again became nearly as much occluded as before. Again subsidence of the growths set in under the administration of iodide of potassium, thirty grains, three times a day, with the one-twentieth of a grain of the bichloride of mercury, the patient gaining thirty-nine pounds in three months; the cribriform ulcer healing upon the scapular region, and the nodes upon the tibiæ being visibly reduced.

The fibrous bands were ruptured by means of a laryngeal bougie at several sittings, and the vocal cords, though still of the same hue as the other tissue of the larynx, can be more plainly distinguished by their sharp edges.

The mercury is withdrawn after two months' administration,

and the compound solution of iodine again resorted to, both locally and internally.

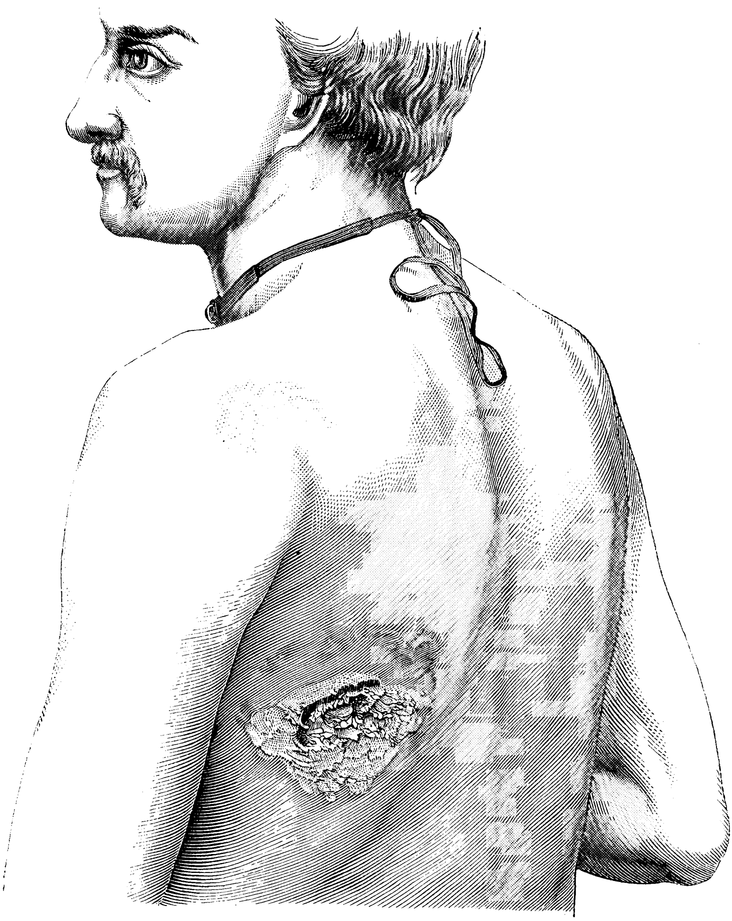
At the date of this writing (April, 1880), six months afterwards, the patient works hard at manual labor all day with the tracheal tube tightly corked up, and by placing his finger upon the tube he can speak in a good clear voice. The vocal cords are lighter in color and free throughout their extent.

There is still some thickening and nodular growths in the larynx about the seat of the operation, which are being treated through the fenestrum of the trachea tube, which is now worn to insure a safe confirmation of the cure.

A cork is worn in the tube preparatory to its permanent removal, so that the patient is practically breathing *per vias naturales;* and the only inconvenience he experiences from it is the conveyance of an unpleasant odor and taste to his nostrils and palate from the muco-pus which accumulates within the trachea tube.

NOTE. *Oct.* 18, 1880.—The tube was removed six months ago; the patient is quite well, and has remained so ever since the removal of the tube; his voice is good, and breathing perfect; he is forty pounds heavier than at date of operation.

PLATE I.



Taken two months after the Tracheotomy.

PLATE II.

Taken two months after the Tracheotomy.

AN ANALYSIS OF THE VALUE OF THE GALVANO-CAUTERY IN THE TREATMENT OF DISEASES AND GROWTHS OF THE NASO-PHARYNX.

BY W. H. DALY, M.D.,
Senior Physician to the Western Pennsylvania Hospital, Physician for Diseases of the Throat and Chest to the Pittsburgh Dispensary.

MUCH has been said and written laudatory of this method of treating diseases and growths in the naso-pharynx. Indeed, so favorable have been the records of experience, and so little has been said about accidents that are liable to attend its employment, that the danger might naturally be considered *nil*. Such impressions in the beginner might tend to indifference in precautionary measures, and lead unexpectedly to consequences unfortunate to both the patient and operator.

The few succeeding remarks, based chiefly upon practical experience, may serve to show that it is a remedy that requires much discrimination and care, and, while very valuable and to a great extent indispensable to the specialist in rhinal and pharyngeal surgery, yet it is one whose employment is followed by both local and constitutional symptoms, even when used with care, and, should accident or carelessness happen, may be attended with more serious consequences.

An experienced and able advocate of the cautery electrode, Dr. E. L. Shurley, of Detroit, Michigan, has recorded, in a paper read before the American Laryngological Association at its meeting in New York, in 1879, and published in the *St. Louis Medical and Surgical Journal*, January 5, 1880, "that in destroying a growth upon one of the turbinated bones with the cautery, he also by accident burned the opposite part of the septum nasi, which nearly resulted in permanent agglutination of the nasal passage."

Once in the writer's experience the accidental burning of the rim of the Eustachian orifice with the cautery electrode, while

removing a growth from the vault of the pharynx, caused otitis media of a serious character. And in another case otitis media purulentia was caused in the ear opposite from the nostril in which an operation was performed, and was attended with symptoms of so serious a character as to threaten the life of the patient. The severity of this accident has since served to make the writer watchful of any possibly unfavorable consequences following the use of the galvano-cautery. In the occurrence of this accident there was a wavering of opinion as to whether the inflammation had been conducted to the middle ear by a nerve or line of lymphatics, or whether the superheated air in the pharyngeal vault had entered the middle ear of the opposite side. The latter is the more probable. In another instance a slight cauterization of hypertrophied mucous tissue upon a turbinated bone caused facial erysipelas that nearly proved fatal.

Carl Michel, of Cologne-on-the-Rhine, a most enthusiastic advocate of the galvano-cautery, admits that some of his patients had a strong vertigo and fever the day after the operation, and that some of them had to go to bed. He notes, apologetically, for this method, that "*Meyer* and *Wendt* had inflammations of the middle ear, followed by suppuration in the patients operated on by them with the modified tonsillitome or *ringmesser*."

It is not improbable that Carl Michel was induced to make the sittings of his patients shorter, viz., "from ten introductions of the cautery electrode to four or five," by the events which he records on page 95 of his most valuable pamphlet, entitled *Diseases of the Nasal Cavity and Vault of Pharynx*, translated by Drs. Shurley and Yemans, viz.: A strong young man, upon whom he had operated with the galvano-cautery, had within two hours violent earache and headache, and in a few days perforation of the tympanic membrane and purulent discharge. In another case there was hard hearing upon the third day after the operation, with perforation and discharge from the ears.

Michel, with pardonable consideration for his favorite method, remarks, concerning the first case, that it was very doubtful whether the operation was the cause of these phenomena, since the patient had in an overheated condition entered the *coupé* of a railroad wagon, and sat beside an open window where a strong draught was blowing upon his ears. And, remarking upon the second case, he says during the same winter the patient under-

went two more attacks of otitis media purulentia without any operation having preceded them.

If these accidents admittedly occur in the hands of the experienced and skilful advocates of the galvano-cautery, then it is fair to presume they will occur no less often in the hands of the inexperienced; and the conclusion must be that it is a remedy fraught with more or less danger to important adjacent organs, and should be used with caution and a full knowledge of the possibility of accidents following its use.

The writer has used the cautery a great deal, and, with the accumulation of experience, has grown to regard it as a valuable remedy, that requires much judgment and care in employment in the naso-pharynx, and to consider its use not always unattended with danger both local and constitutional. He has observed that in about fifty per cent. of the cases in which the galvano-cautery is used in the nasal cavities for the reduction or destruction of new growths, there are local and constitutional symptoms following.

The word *reduction* is used because the writer has observed that the electrode, heated to a cherry-red, and applied to small adenoid growths, will hasten their reduction or absorption, while at the time of application there will apparently be no destruction of growth whatever, or other change than an increased redness of the part, as though it were merely irritated, and for three days following there will be swelling and increased redness in the growth, after which it pales, softens, and absorbs rapidly, leaving no scar or other trace of its former existence.

The immediate local symptoms will depend much upon the locality of the application of the heated electrode; for instance, when applied upon the anterior ends of the middle turbinated bone, a pain will extend into the eye of the same side, and if applied further back the pain will extend into the ear of the opposite side. More than once patients have been observed by the writer to quickly place one hand upon the eye of the same side on which the cautery electrode was being applied, while the other hand was placed upon the ear of the opposite side to deaden the pain produced.

When operations are made further back, the parts are found immediately more insensitive.

Constitutional symptoms may supervene within two hours, or be deferred for twenty-four, thirty-six, or forty-eight hours after

the operation, such as actual fever, attended with increase of temperature, headache, faceache, soreness in the calves of the legs and muscles generally, creeping chills and loss of appetite, paleness of face and torpidity of the bowels. This condition may last for five or seven days, and then subside.

During this time the patient will insist that he has caught cold; and follicular tonsillitis, with swelling of the posterior pillars of the half arches, may be present to confirm his suspicion. But operations at subsequent times, with every precaution, will be followed by the same chain of symptoms, to convince him that not taking cold, but the operation itself, produced the depressing effect upon the system.

These symptoms do not follow so surely, nor are they usually so severe as to make it necessary to warn the patient that they will follow; but they should never be unlooked for by the operator, and every precaution should be taken by him to avert their occurrence, and, should they occur, to meet them promptly to prevent destructive consequences.

In summing up the value of the galvano-cautery, it may be doubted whether it will ever become a popular instrument in the hands of the general practitioner, since its expense is considerable and its behavior often capricious. It has the advantage over other caustics that it can be carried to the part, and the current be closed, and the work done; while other caustics, such as nitrate of silver, caustic potash, etc., are liable to touch other parts, and the pain attending their use often lasts for twenty-four hours or more.

In the greater number of erectile, adenoid, polypoid, hypertrophic growths in the nasal cavities, the mineral caustics, carefully guarded, will do the work as well as the galvanic cautery, and are altogether less liable to be followed by serious local or constitutional symptoms, besides having the merit of readiness at little expense and trouble.

ON THE INTRODUCTION OF LIQUIDS INTO THE EUSTACHIAN TUBE AND MIDDLE EAR.

By S. J. JONES, A.M., M.D.,

ILLINOIS.

The question of safety in the passage of liquids into the Eustachian tube and middle ear is one that has interested otologists in no small degree. In this, as in other matters, doubtless the test of time decides the value of theories.

About the year 1800, Sir Astley Cooper advised and practised puncture of the membrane of the drum of the ear, in the belief that impaired hearing resulted, in many cases, from complete occlusion of the Eustachian tube, and consequent rarefaction of the air in the tympanum, and that admission of air to the tympanic cavity, through an artificial opening, would restore hearing.

At a later date, Horner, of Philadelphia, practised similar puncture of that membrane; but he went further than Cooper, and forced air, through the external meatus and an artificial opening thus made, into the middle ear, causing it to escape through the Eustachian tube into the fauces, with the double purpose of admitting air to the middle ear and of blowing accumulations of mucus from that cavity. Later, he forced in liquids in the same way, washing the abnormal contents of the tympanum through the Eustachian tube, serving to clear the middle ear, and to dilate the Eustachian tube.

Others seem not to have adopted the procedure, and it was lost sight of until about the year 1868 or 1869, when Hinton, of London, revived it for the same purpose, and claimed for it great advantages in the removal of dried accumulation in the middle ear, which the investigations of Toynbee had shown to exist more frequently, and to a greater extent than had been supposed.

To remove such dried secretions, without puncture of the

membrana tympani, Allen, also of London, forced a stream of tepid water through an Eustachian catheter into the middle ear, and allowed them to dissolve, and thus gradually to escape into the pharynx.

After seeing the tolerance shown by the mucous membrane of the middle ear, when suppuration has caused spontaneous perforation of the drum-head, and having witnessed, in the hands of Hinton and Allen, the procedures followed by them without any unfavorable results, I adopted their plans, electing one or the other as might seem the more desirable in each case. After having pursued this plan for more than nine years, without having had occasion to regret it as far as I am aware, I am convinced of the advantages of introducing liquids into the middle ear in certain pathological conditions, more especially in those cases of chronic non-suppurative inflammation of that cavity attended with dryness.

In addition to the benefit that the liquid is to the middle ear, and its effects on the contents of that cavity, it aids in opening the Eustachian tube, and after its use, even in very small quantity, it will be found that air can be forced through the Eustachian tube into the middle ear in larger volume than before such moistening. Moreover, I am accustomed to use a stream of liquid with a syringe and Eustachian catheter as a very useful mechanical means of dilating the Eustachian tube in great diminution of its calibre, instead of using Eustachian bougies. Considerable pressure may thus be made without giving pain, and without danger of laceration of the mucous membrane, or of the danger of breaking of bougies. The operation is simple; it is easily done, and is efficacious. It is the reverse of the method practised by Horner, when he distended the Eustachian tube by liquid forced through the external meatus and middle ear into the Eustachian tube.

It is claimed that as the middle ear, in its normal condition, contains only air and mucus secreted in sufficient amount to keep it moist, the introduction of any liquid into it is unnatural and must do violence.

If such be the case in its normal state, it does not follow that the same must be true in a pathological condition.

The same conditions pertain to the naso-pharynx, yet I am not aware that it is claimed that, because this space, in its normal condition, is a cavity for air, and has a mucous lining, it

would be unwise to introduce any liquid into it in chronic catarrhal inflammation of its lining, with accompanying thickening and altered secretions. On the contrary, removal of such secretions and lubrication of the surface not only give comfort to the patient, but greatly aid respiration. If such treatment benefits this portion of the mucous lining of this cavity, why should not the same good results follow a continuation of the treatment to the other parts of the same membrane that extend through the Eustachian tube, and form the lining of the middle ear and mastoid cells? It may be answered that, in consequence of the conformation of the naso-pharynx, any liquid introduced into it will readily escape, either forwards or backwards, and will not remain long in contact with the parts, whilst liquids will be longer retained in the middle ear.

This difference can be compensated for by adapting the liquid used to the difference in the conditions, which requires that they should be less irritating in character.

It is an established fact that acute inflammation of the middle ear has repeatedly followed the use of the usual douche for affections of the naso-pharynx.

If it be assumed that such use of the douche caused the inflammation of the tympanum, it gives rise to the inquiry whether it should not rather be called abuse than use of the douche that is responsible for that result. There are certain precautions in the use of that douche that cannot, with safety, be disregarded. The evil results that have followed its use may have been owing to too low a temperature of the liquid used; or the liquid may have been of too irritating a character to be long retained in so sensitive a cavity, whilst it could with safety be used in the naso-pharynx, because of its ready escape therefrom, or the column of liquid may have been of such elevation as to do mechanical violence by its pressure. The inflammation may have resulted from one or more of these causes.

Another argument that has been urged against the entrance of liquids into this cavity is that, in sea-bathing, if salt-water enters it, acute inflammation follows. This may or may not be so. It seems not unlikely that, in many cases, important factors are overlooked in estimating probable causes of a recognized consequence. During an experience of two years, extending over a distance from the coast of Maine to the coast of Georgia, as a surgeon in the navy of the United States, during the block-

ade in the late civil war, I had frequent occasions to observe the results of exposure of men on the vessels of the blockade, and in going from a northern port and in returning to it, in producing inflammation of the middle ear. At a later date, I had a similar opportunity of making such observations on the New England coast, during one summer that I was surgeon of a practice ship for naval apprentices.

During the period of the blockade, the ship's crew suffered considerably, at times, from acute inflammation of the middle ear, but it was usually when the vessel was very wet from storms, or when her decks were damp from washing them. At the season when the crew bathed most in the sea, there were comparatively few cases of such inflammation, notwithstanding the fact that the men would dive a great deal, and would frequently leap from some part of the ship into the sea, with consequent concussion and exposure as great as the effect of breakers in sea-bathing.

The same was true in regard to the bathing of naval apprentices, with this difference in the result, that a case of acute inflammation of the middle ear was a rare occurrence during the whole summer cruise, although the boys and young men bathed in the sea almost daily when in port. This exemption was probably due in part to the fact that the decks of that ship were not kept damp by unnecessarily frequent washing of them, and there was less exposure to storms than on the blockade; but we were in a more northern latitude.

These facts seem important as throwing some light on the subject of causation of a disease which is generally supposed to be a direct result, either of admission of liquids into the external or middle ear or both, or else of the mechanical violence of waves impinging on the ear. Little heed seems to be taken of the disturbance of the general circulation, which causes such local congestions and inflammation, either from rapid change of temperature of the body from sudden or too long-continued immersion of it in water of much lower temperature, or from the wearing of clothing made damp by the atmosphere of evenings at the sea-side, especially by persons who are accustomed to the drier atmosphere of an inland residence.

So much has been said concerning the effects of sea-bathing on the production of ear disease, that we may with advantage

review the general impression of the danger from accidental admission of sea-water to the ears.

So, also, in regard to the effect of liquids designedly introduced in pathological conditions.

The object of this paper is to ask a more careful revision of accepted views on this point, and the more general adoption of a procedure that has been shown to be not only free from danger when judiciously practised, but to be highly beneficial in certain conditions.

Since water made slightly saline is better tolerated by the mucous membrane than when pure, the addition of borax, or chlorate of potassa, or some kindred substance to it is desirable.

The amount of liquid to be introduced should be governed by the object to be accomplished. The temperature of it should be the same as that of the blood, and it should not be forced into the tympanum with violence. Then pain scarcely ever results; and the patient usually finds that after a few hours have elapsed a more comfortable feeling in his ears is experienced—more open, as it is often expressed—than had been experienced for a long time before.

It is conceded that the impressions of patients often aid in guiding our treatment; and I have so often been assured by those whom I have treated in this way of the comfort (with improvement in hearing) that has followed it, that I can confidently advise its more general adoption.

THE PRESERVATION OF EYES IN WICKERSHEIMER'S FLUID.

By E. GRUENING, M.D.,

NEW YORK.

A FEW months ago the Prussian Government made public a formula for the preparation of a fluid called Wickersheimer's. The fluid is said to preserve animal and vegetable specimens wonderfully, and prevent any alteration in their form and elasticity. The formula, as published in the *Berliner Klinische Wochenschrift*, is as follows: To 3000 parts of boiling water put 100 parts of alum, 25 parts of common salt, 12 parts of saltpetre, 60 parts of potash (kali carbonum), 10 parts of arsenious acid; cool and filter, and add to ten parts of the solution four parts of glycerine and one part of methylic alcohol. In the *Centralblatt für die Medizinischen Wissenschaften*, Jan'y (No. II.), 1880, Dr. Broesicke states that the formula published by the Prussian Government contains two errors which should be corrected. Broesicke obtained a different formula from Mr. Wickersheimer. The discrepancies in the two formulæ are the following: the Government formula prescribes 10 parts of arsenious acid and 1 part of methylic alcohol; and Broesicke's 20 parts of arsenious acid and 4 parts of methylic alcohol. I had the fluid put up according to either of these prescriptions. Mr. Fingerhot, the druggist, at the corner of 59th Street and 3d Avenue, New York, made the fluid in accordance with the Government prescription; and Mr. Bilbeck, the druggist of the German Dispensary, prepared it according to Broesicke's formula. The first of these fluids is slightly opalescent and perfectly clear. The first preserves the transparency of the refractive media of the eye, while the second does not. The eye which I place before you has been three weeks in Wickersheimer's fluid, prepared according to the Government formula. It is an eye with glioma of the retina. The

cornea is clear, the anterior chamber of normal depth; the iris blue in color, the lens transparent; and even to-day, in this eye that has lain in a preservative fluid three months, the diagnosis of glioma of the retina could be made.

Eyes placed in the fluid prepared by Mr. Broesicke's formula are not preserved so perfectly. The lens becomes opaque in a few hours; the cornea and iris after a few days, or even in the course of the week, are as opaque as a cornea preserved in absolute alcohol.

THREE CASES OF TUMOR OF THE LACHRYMAL GLAND.

By H. KNAPP, M.D.,

NEW YORK.

Owing to an acute laryngitis, Mr. President and Gentlemen, which makes it almost impossible for me to speak, I can give only an abridged history of the cases, and make some short remarks in explanation of the microscopic specimens I shall place before you.

Case I. *Myxo-Adenoma of the Lachrymal Gland.*—Mr. C. G., æt. 31, noticed ptosis eighteen months before he presented himself to me. No pain. Eyeball gradually pushed downward. On March 12, 1880, I found: Ptosis; eyeball pushed down and forward, moved upward only to horizon. An uneven, immovable, moderately consistent tumor occupied the upper outer corner of the orbit, projecting beyond the superciliary arch. S $\frac{15}{200}$. Retinal veins dilated, retinal tissue on and around disk slightly hazy (œdematous).

I removed the tumor March 13, 1880, in the presence of Drs. Agnew, Webster, and the medical staff of the New York Ophthalmic and Aural Institute. A curved incision was made along the upper and outer orbital margins; the tumor was exposed, detached with scissors and scalpel from its surroundings, and easily removed *in toto*, and in its capsule. The eye receded. The whole wound was closed with sutures, and healed without pain, swelling, or discharge, in five days. The patient, living at some distance, went home ten days after the operation perfectly cured. Mobility of lids and globe, as well as the position of the latter, normal.

Under the microscopes you will find sections of the tumor exhibiting the structure of adenoma in the most beautiful and typical form. In some places there is myxomatous tissue. The specimen, therefore, should be termed *myxo-adenoma*.

CASE II. Father B., æt. 32. Exophthalmus five years ago. Lachrymal tumor removed three years ago by Henry W. Williams, of Boston, and described in the *Boston Med. and Surg. Journ.* as epithelioma of the lachrymal gland. Two months later the eye protruded again, and was, at the time I saw the patient, considerably pushed forward, down and inward. A nodular tumor, of fleshy consistence, occupied the whole upper-outer half of the orbit. The lid was swollen, pushed forward by the tumor, and could not be raised. The eye did not move up and outward. Sight was good. Retinal venous hyperæmia, and some œdema.

The removal of the tumor, which I did Nov. 28, 1879, was tedious and laborious. The growth extended along the entire upper and outer walls of the orbit, being in firm connection with the periosteum. Its front part projected as large lobular masses into and beyond the orbital cavity; the posterior part, however, crept, as flat swellings, along the bony walls, and had to be removed with gouges and scissors. The removal was very thorough, and a considerable part of the bony wall of the orbit was denuded. The optic nerve was not cut, as it could be felt with the finger, but all the tissue on its outer side was removed. The wound was united by sutures, except on the outer-lower side, where a drainage-tube was inserted. When the operation was completed, the upper lid was inert, the eyeball moved only inward, the pupil was medium-sized, and absolutely immovable, the eye blind, the retinal arteries very thin, the veins gorged with dark blood, tapering at their exit from the disk. Evidently the retinal artery, with many other orbital vessels, had been cut.

The healing was unexpectedly smooth. Only a few drops of serous liquid—no pus—oozed from the drainage-tube. Four days after the operation, the tube was left off; four days later the wound was completely closed, *per primam*.

The examination of the fundus oculi showed a milky retina, with a cherry-red macula lutea, retinal veins numerous, dark, engorged, and tapering at the disk; arteries very small. In the course of several weeks, the retinal tissue became transparent again, and the retinal vessels, both veins and arteries, shrunk much beyond their natural calibre. The upper lid remained immovable, the eye blind. Patient was kept under observation for about a month, and several months later, when last heard from, there was no indication of a relapse.

The specimen shows, under the microscope, a large accumulation of epithelial cells, some connective tissue cords; but in some places plain *adenoma* structure. The growth, therefore, may be styled *adenoma carcinomatosum.*

Case III. A woman of 26 years was operated on by me, in 1865, at Heidelberg. A large tumor, starting from the region of the lachrymal gland, had filled the whole orbit, protruding beyond the palpebral fissure, and carrying the shrunken eyeball before it. It had a fleshy consistence, with soft parts. I removed it entire, emptying the whole orbit. The specimen—which I preserve and have examined again—shows hypertrophied lobules of gland, cysts, areolar cancer, and myxoma structure. No doubt it is also an adenoma, but from its further development should be styled a *myxo-adenoma carcinomatosum.*

DEMONSTRATION OF THE REFRACTION OF LIGHT BY ASYMMETRICAL SURFACES, AND THE DETERMINATION OF ASTIGMATISM WITH GLASSES AND THE OPHTHALMOSCOPE.

By H. KNAPP, M.D.,

NEW YORK.

In the theory of astigmatism there is in reality only one truly difficult point, namely, the demonstration of the course of the rays that are refracted by the meridians situated between the principal. As we have learned by heart, Sturm has mathematically proved that the rays refracted by asymmetrical surfaces are collected in the so-called focal interval which is bounded by two straight lines, being at right angles to each other and in the planes and foci of the principal meridians. To the student not familiar with mathematical analysis, it must be a mystery how Sturm found that out, since it seems so natural to assume that the meridians whose curvature is between that of the meridian of the strongest and that of the meridian of the weakest refractive power, have foci between the foci of these two meridians. But, gentlemen, this is utterly wrong: the intermediate meridians have no foci at all. Even if by the smallest stenopæic slit you exclude the refraction of all other meridians, the rays refracted by any intermediate, let me call them diagonal, meridians would not be collected anywhere. The reason for this proposition I can demonstrate to you in the plainest manner on this model, which, as you see, is made of beeswax, and, imitating the human eye, represents a triaxial ellipsoid. Pins are stuck in the wax along the horizontal, the vertical, and two diagonal meridians, so as to represent the normals of these meridians in a sufficient number of successive points. At once you see that the normals of the vertical and horizontal meridians only are in one plane, whereas those of the diagonal meridians are not, but curve around like a spiral, forming what is

called a "skew" surface (*surface gauche* in French; *windschiefe Fläche* in German). Now, as the incident and refracted rays must be in the same plane with the normal, it is evident that the incident and refracted rays can be in one plane only in such meridians whose normals also are in one plane. This condition, as you see, is fulfilled only by the principal meridians.

The course which the refracted rays of all meridians combined really take, *i. e.* Sturm's focal interval, is represented by a thread model which I constructed and described in Graefe's Archives about twenty years ago, and which has become somewhat popular. I take pleasure in demonstrating it, as it shows very plainly all the intricacies of refraction by asymmetrical surfaces.

Let us now add some remarks on the *practical determination of astigmatism.* Among the various modes of determining and correcting astigmatism, I have, for practical purposes, from the beginning preferred the use of a complete set of cylindrical glasses and the ordinary (Snellen's) test-types, as follows:—

1. Determine S with and without glasses, far and near.
2. Determine ametropia with spherical glasses.
3. Put before the eye, and in ametropia before the correcting spherical glass, a concave cylindrical glass, beginning with $\frac{1}{48}$, turn it and see whether or not, how much, and in what position, S is improved. Note the direction of the axis and try stronger numbers until the greatest obtainable improvement of S is found.
4. Try convex cylindrical glasses in the same way.
5. Having determined the most suitable cylinder, put it in a frame, and for the sake of verification of the ametropia, put different spherical glasses before the cylinder, as if you had to determine a simple case of ametropia. In this way you obtain a formula of either a plano-cylindrical, or a sphero-cylindrical glass, never a bi-cylindrical, which, even for mixed astigmatism, should be avoided, as such glasses are more expensive and more difficult to grind correctly—especially in regard to centration—than sphero-cylindrical glasses, which produce the same optical effect.

Of course, what I have just said does not exhaust the method of examination, it only lays down the principle; the prescription of glasses has to be governed by general rules, taking into account M, H, Pr, S, accommodation, the age of the patient, and the nature and duration of his work.

Only seldom, gentlemen, I use another subjective method,

though I never omit to test for astigmatism in any case of amblyopia or asthenopia by this method and the ophthalmoscope.

The Determination of Astigmatism with the Ophthalmoscope is still in its infancy. The different methods that have been made known are as follows:—

1. The difference of shape of the disk noticed in the erect and inverted images and at different distances, is available only in the higher degree of As. and for qualitative determinations.

2. The distortion of the retinal image: disk, bloodvessels, etc., corrected by cylindrical glasses or a Stokes' lens behind the ophthalmoscope, is recommended by Schweigger, Schöler, and others. Schöler uses an ophthalmoscope with two disks above each other, the one containing spherical, the other cylindrical glasses. I think this method is very inconvenient, and have not learned anything as to its accuracy.

3. A rotable stenopæic slit, I suppose, has all the advantages and disadvantages of the stenopæic apparatus for subjective determinations. It is splendid for the description of astigmatism in the lecture-room and text-book, but tiresome and unsatisfactory in practice.

4. The determination of the refractive condition of the principal meridians with the refraction-ophthalmoscope rests on the fact that the horizontal focal line (supposing that the horizontal and vertical are the principal meridians) is in the focal plane of the vertical meridian, and *vice versa*. If we look into an astigmatic eye, horizontal and vertical lines—say small bloodvessels—even when they are situated in the same plane, do not simultaneously appear with equal distinctness. When the ophthalmoscopist sees clearly a fine horizontal bloodvessel, he is accommodated for the vertical meridian of the eye examined, and *vice versa*. This fact, gentlemen, the nucleus of the method which I have cultivated for years, I beg to demonstrate on another model.

The model, roughly executed for my class of students, consists of four pieces of heavy drawing paper fastened vertically in a cigar box, over which they project about 3″. The first and second are about 2″ apart, the second and third about 4″, the third and fourth 1″. Of course, these dimensions are not essential. On the first, representing the fundus oculi, I have drawn a vertical line. Colored threads pass from three points of that

line through a circle in the second piece of paper, representing the pupil. The two threads passing from the middle point through the upper and lower ends of the vertical meridian of the pupil unite in one point in the third piece of paper, which, as is clear, represents the focal plane of the vertical meridian. After passing through, they diverge and strike the fourth paper, always remaining in the same plane, the upper ray being lowest, the lower ray highest on the fourth paper. The two rays which, emanating from the same point and passing through both ends of the horizontal meridian, pass through the third paper on both sides of the point of union of the two vertical rays, and unite in the fourth paper midway between the vertical rays. This point of union shows that the fourth paper is in the focal plane of the horizontal meridian. The rays emanating from the same point, and passing through the ends of the intermediate meridians in the pupil, pass through a horizontal line of which the point of union of the vertical rays is the centre, and the horizontal rays are on its extremities; in the fourth paper they pass through a vertical line of which the point of union of the horizontal rays is the centre, and the vertical rays are the extremities.

The rays emanating from the upper point of the vertical line on the first paper form a horizontal line on the third paper underneath that formed by the central point, and a vertical line on the fourth paper coinciding with the previous line, only not reaching quite so far as its upper end and a little farther than the lower. The rays emanating from the lower point of the vertical line in the first paper form a third horizontal line on the third paper, a little above the line formed by the first point, whereas on the fourth paper they coincide again with the same vertical line, not reaching its lower end, but a little exceeding its upper. Thus the different points of a *vertical line* in the fundus oculi, sending forth rays through an astigmatic refracting system (lens-cornea), form in the focal plane of the vertical meridian a number of horizontal lines, one above the other, coalescing in a broad stripe, whereas in the focal plane of the horizontal rays they form one sharp vertical line. The ophthalmoscopist, therefore, will see the vertical line in the fundus oculi of the patient clearly when the vertical dispersion line formed by the rays emerging from the patient's eye coincides with his retina, that is, when he is accommodated for the refraction of

the horizontal meridian of the patient. The same analysis will show that the points of a horizontal line in the background will form a sharp horizontal line in the focal plane of the vertical meridian, but a broad horizontal stripe in the focal plane of the horizontal meridian. Therefore, an ophthalmoscopist accommodated for the horizontal meridian of his patient will see the vertical lines of the fundus distinctly, the horizontal lines indistinctly, and *vice versa*, Q. E. D.

The mode of examination is the following: Always with relaxed accommodation you look into an eye and turn the revolving disk with the auxiliary glasses until one set of fine vessels is perfectly plain. If, at the same time, the others are likewise plain, the eye examined is not astigmatic. If, however, they are not so plain, you turn the disk until they are. The greatest difference of refraction gives you the principal meridians, and, at the same time, the degree of astigmatism and its kind, simple, compound, or mixed.

Now, gentlemen, you will tell me: "This is all very well, and we have known that before; but with what degree of accuracy can astigmatism be determined in that way?" To this I answer: "It can be done with the same, or at least almost the same, accuracy as the ophthalmoscopic determination of simple ametropia, where a difference in refraction of 0.5 D, *i. e.*, $\frac{1}{72}$, is easily noticed." Let me illustrate this by one example, referring to the wife of one of the medical gentlemen here present.

Mrs. Dr. R., æt. 30, asthenopia and amblyopia all her life.

RIGHT EYE. S $\frac{20}{100}$. No improvement with spherical glasses.

O. S. vertical vessels clearest with 0.5 D ($\frac{1}{72}$); *i. e.*, horizontal meridian H 0.5 ($\frac{1}{72}$). Horizontal vessels clearest with 3.5 D ($\frac{1}{10}$); *i. e.*, vertical meridian H 3.5 ($\frac{1}{10}$).

Astigmatism. hyperop. composit. 4.0 D ($\frac{1}{9}$). The horizontal meridian, against the rule, is the more strongly curved.

Functional examination. Glasses from + $\frac{1}{8}$c to $\frac{1}{12}$c; axis 15° give S $\frac{20}{30}$. Prefers $\frac{1}{8}$c 15°.

LEFT EYE. S $\frac{20}{100}$. Not improved with spherical glasses.

O. S. vertical vessels clearest with 0.0 D ($\frac{1}{\infty}$); *i. e.*, horizontal meridian E. Horizontal vessels clearest with + 3.5 D ($\frac{1}{10}$); *i. e.*, vertical meridian H 3.5 ($\frac{1}{10}$).

Astigmat. hyperop. simplex 3.5 ($\frac{1}{10}$). The horizontal meridian here also, against the rule, the more strongly curved.

Functional examination. Sees best with from $\frac{1}{8}$c to $\frac{1}{12}$c; axis 0° (horizontal), S $\frac{20}{50}$. Prefers $\frac{1}{8}$c 0°.

With both glasses together sees very comfortably and reads without inconvenience.

This is a high degree of astigmatism, and S was greatly im-

proved by the glasses. In other cases I found with the O. S. equally high or still higher degrees, but S was less improved, and the patients preferred weaker glasses. This discrepancy is no reason to distrust the ophthalmoscopic determination; on the contrary, the functional examination did not bring out the full amount of astigmatism, which, at least in part, was what is called incorrigible. Though, as I have said, for practical purposes the determination with cylindrical glasses should principally be relied upon, *i. e.*, govern the formula for the spectacles the patient has to wear, at least for some time, in such cases I would use still other subjective tests—radiating lines, stenopæic apparatus—in order to see how far they agree with the ophthalmoscopic determination. It is not without interest, nor without importance, to ascertain the degree of meridional asymmetry in cases of so-called incorrigible astigmatism, as the cause of the amblyopia might erroneously be sought in the optic nerve or brain.

The ophthalmoscope I prefer for this and all purposes is one with twenty-eight glasses in a single disk, covered and centred, the mirror fixed (not tilting), the hole 3.5 mm. in diameter. The workmanship (by Miller Bros.) is unsurpassed, there being no reflexes, no jarring in the easily moving disk, and the image perfect. I also use an O. S. with thirty-three glasses, but find twenty-eight sufficient. The ophthalmoscopes with two whole or fractionary disks are all inconvenient, and the advantage of a tilting mirror is, to a large degree, more imaginary than real.

A CASE OF PERICHONDRITIS AURICULÆ.

DEMONSTRATED BY H. KNAPP, M.D.,
NEW YORK.

THE demonstration was accompanied with the following remarks:—

The genuine inflammation of the perichondrium of the ear has not received due attention on the part of authors. I therefore beg to present a typical case of it.

Patient, a lad of about 15, always healthy in body and mind, had, four months ago, a circumscribed swelling in the right auditory canal behind the tragus. It was thought to be a furuncle, and incised. Some viscid liquid escaped. The swelling diminished, but went over to the posterior part of the canal, and from there successively to the concha, and all over the auricle, with the exception of the lobule. Distinct fluctuating prominences were opened, and viscid liquid escaped. By probing, the perichondrium was found detached from the rough cartilage. A drainage tube and pressure bandage were applied. The posterior surface was red and evenly swollen, but there never was any fluctuation. About two months after the beginning, the swelling was at its height. The auricle presented a swollen, misshapen mass, as you see in the photograph. Then gradually the fistulous openings closed, the swelling diminished, and the auricle, as you see it now, also from the second photograph, is much reduced in size and irregularly shrunken. The lobule has been unchanged.

CONTRIBUTIONS TO OTOLOGY.

By S. D. RISLEY, M.D.,
PENNSYLVANIA.

MR. PRESIDENT AND GENTLEMEN: The following cases, selected hurriedly from my case-book of ear disease, have seemed of sufficient importance and value, not only to place permanently upon record in the annals of this society, but to justly demand a few moments of the valuable time during this annual meeting.

They are selected, the first as an illustration of the value of perfect rest and freedom from exposure in the treatment of serious and threatening ear disease; the second and third cases as marked illustrations of how simple local conditions may give rise to violent storms in the entire nervous system, and by the severity and malignant portent of the symptoms awaken the gravest apprehensions, and lead the physician or surgeon to an unnecessarily grave prognosis.

CASE I.—*Acute Purulent Inflammation of Ear, involving Mastoid Cells, and causing Meningeal Irritation, treated by rest in bed.*

P. T., a boy aged 13, with bright red hair, freckled face, and fat, flabby tissues, consulted me at the Eye and Ear Dispensary of the Episcopal Hospital at Philadelphia, on a cold, damp day, in April, 1879, barefooted, and thinly clad, complaining of a profuse discharge from the right ear, with marked tinnitus *and severe right hemicrania.*

He staggered into the clinic room like a person just up from a protracted fever. He was pale, weak, and trembling. His hands were cold and clammy, and profuse beads of perspiration stood out on his forehead. The pulse was rapid, quick, and thready, easily compressible. There was great mental hebetude, so that but little information could be gleaned from him. But the following history was gained from his mother, who came with him. He was taken from his bed to be brought to the hos-

pital. For many days he had been in bed alone in the house, while his mother—the only other member of the family—was away attending to her duties as a washerwoman. He had had a discharging ear since an attack of one of the exanthemata in childhood. Inspection showed a moderate discharge of thick, creamy pus from the meatus. The auricle stood out rigid and tense; the meatus was swollen and puckered, so that at a point midway between the membrana tympani and external orifice the calibre was not more than 2 millimetres in diameter. It caused pain to extend the meatus by traction on the auricle, or percussion over the mastoid, and there was some swelling and redness of the tissues over the mastoid process. The meatus was carefully cleansed by syringing with warm water, and a probe covered with a narrow pledget of absorbing cotton carefully carried to the bottom of the meatus. This was followed by an abundant flow of thin, chocolate-colored discharge, very fetid. There was no paralysis anywhere. The case was diagnosticated as one of mastoid disease, with marked meningeal irritation, if not fully developed meningitis. The boy was admitted to the house, placed in bed, warmly covered, and perfect quiet enjoined, and frequent syringing of the ear with warm water directed. Leeches were applied over the mastoid, and a thorough evacuation of the bowels secured. The temperature, on admission, was taken, but unfortunately no record preserved.

Trephining the mastoid was to be done the following day, if there were not a decided amelioration of the symptoms. At the end of a week he was entirely free from all threatening symptoms. The bottom of the meatus, which could now be carefully studied through an unusually large meatus, was found filled with polypoid granulations. The subsequent treatment of the case was conducted at the out-door service, and presented no unusual interest.

There is no room for doubt that this boy's life was saved by the confinement to a warm bed, and the better hygienic surroundings of the hospital.

Many examples of acute purulent inflammation of the middle ear and Eustachian tube, in adults and young children, have served to convince me of the importance of a perfect protection from exposure, especially during the cold damp days of our winter months. It is quite as important, for their perfect and

rapid recovery, that they should be confined not only to the house, but in bed, as in an attack of pneumonia or pleurisy.

Although life may not in all cases be in such great jeopardy as in pneumonia or pleurisy, nevertheless the usefulness of the organ is in great danger. By this means alone, with no meddlesome local treatment, a large number of these cases will recover, without permanent injury and without the protracted chronic suppuration. Another lesson taught by this case is that it is not the first duty of the aural surgeon to fly to the operation for opening the mastoid cells even in severe cases of disease evidently involving the mastoid antrum.

CASE II.—*Foreign Body in the External Auditory Meatus; Strange Nervous Symptoms; Relieved by Removal of the Foreign Body.*

H. H., a carpenter, came to the Episcopal Hospital service, complaining of the following symptoms, which he associated with his left ear, since he could relieve them by pressing his finger firmly in the external meatus.

For several years he had suffered from intermittent tinnitus. He complained of loss of memory and giddiness. The latter symptom was so marked that he was unable to attend to his work. He said he was getting stupid, and was afraid of insanity or suicide. The only way he could get about alone was by thrusting his little finger far into the meatus, or by plugging it with a pledget of cotton-wool, which he made into a long, narrow roll, and thrust it far into the meatus. I removed one of these rolls of cotton, and with the mirror and speculum discovered at the bottom of the meatus, freely movable, a dark brown mass. By aid of gravity and fine angular forceps it was removed entire, and with but little difficulty. It was the size of a large pea, very compact, and its surface as smooth as a leaden bullet. It proved to be a mass of inspissated cerumen, hair, epithelial scales, and dust. The tympanic end of the meatus was dilated apparently, and in this the hard bullet-like mass had rolled about with every movement he made, bouncing about against the membrana tympani and malleus handle.

I did nothing further for him, and with difficulty persuaded him to make the attempt to venture homeward without the cotton pledget. He did so, however, and returned, by request, to the clinic at the end of a week, having been entirely free from his symptoms, and able to return to his work.

CASE III.—*Impacted Cerumen; Tinnitus Aurium; Simulating Early Symptoms of Locomotor Ataxia.*

Mrs. T. consulted me in March, 1880, complaining that for a week she had suffered from a noise, like escaping steam, in the right ear. Her bitterest complaint was the extreme degree of nervousness occasioned by the noise, which aggravated her like the filing of a saw. She had occasional shoots of pain through the ear, which came as suddenly as electric flashes. Several years before she had had a similar attack, which lasted nearly a year and disappeared suddenly. In both attacks there was simply difficulty in differentiating sounds, the voice in conversation being a confused sound. In this attack, however, she complained that she could not feel the floor or ground perfectly, and described the sensation by saying that she seemed constantly walking on deeply padded carpets. There were no shocks of pain in the extremities, and general sensation was perfect.

Inspection revealed the meatus on the right side well filled with yellowish cerumen, soft, and readily removed by the spoon and syringe. A large mass of this was removed, and, somewhat to my surprise, behind it was found a second mass, evidently of an older date, since it was nearly black, its surface concave, and reflecting light strongly from its hard, smooth surface. This was removed with great difficulty after several days of soaking. The meatus was excoriated under it, and there was a small superficial ulcer on the superior anterior quadrant of drum head, which perforated only its epithelial layer.

The tinnitus, pain, and deafness at once disappeared, but the sensation in the feet only gradually grew better, and in ten days had entirely disappeared.

As examples of reflex irritation, these seemed of sufficient importance to bring them before you. These cases had both been regarded as cases of severe nerve lesion.

It is not my purpose to discuss the complex problem of reflex nervous symptoms, but I desire simply that they should serve to point out the necessity, in obscure symptoms of disease, of examining carefully the ears as well as the other organs of the body.

SOME REMARKS ON THE LESIONS OF THE LARYNX IN PHTHISIS.

By CARL SEILER, M.D.,
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In all cases of pulmonary phthisis in which laryngeal symptoms are present, and in most of those in which no such symptoms are observed, we find with the laryngoscope certain changes in the larynx. Having observed these changes in a large number of cases, and found them to stand in a certain relation to the lesions in the lungs, I examined a number of larynxes microscopically in order to find the causes of the peculiar appearances seen during life.

The method of examination adopted is published elsewhere,[1] and it will, therefore, not be necessary to dwell upon it here. All that I would say in regard to it is, that I have examined sections of the larynx made in different directions, and comprising *all* the parts so that their relation to each other could be studied. The changes observed in the laryngoscope are, first, a pyriform swelling of the arytenoid cartilages and aryepiglottic folds; then a swelling of the crest of the epiglottis, causing it to assume a horseshoe-shape; and, finally, ulceration of various parts. These ulcerations occur earliest in those parts which are exposed to the greatest amount of irritation by motion, viz., the inter-arytenoid space, the vocal cords, and the epiglottis.

I first endeavored to prove that the simple swellings of the aryepiglottic folds and of the epiglottis are not merely caused by infiltration of serum into the submucous connective tissue, as is supposed by some authors, by making incisions in these parts in a number of cases without producing a reduction of

[1] Archives of Laryngology, vol. i. No. 1.

the swelling, or relieving the symptoms caused by them, and by careful measurements of larynxes showing these swellings before and after they had been hardened in alcohol, that is, before and after the water had been extracted. In these latter experiments I found that the amount of swelling was but little reduced by the action of the hardening agent, while it should have been completely reduced thereby, if it were due to simple serous effusion. Such a result we observe in mixomatous tumors, which are largely composed of watery mucus, and which almost entirely shrivel up under the influence of alcoholic hardening.

I next took such hardened specimens, and subjected them to microscopical examination, making both transverse and longitudinal sections of the aryepiglottic folds. Thus, I found that the epithelial cells of the mucous membrane were normal, except that they were but loosely attached to the basement-membrane. The submucous tissue was infiltrated with a small-celled infiltration, which in many places had formed depôts, the centres of which showed cheesy degeneration. The most marked change, however, was found in the mucous glands and their ducts, as well as in the lymphatics. The tubules of the glands appeared in many instances completely filled with proliferated epithelial cells; their diameter was greatly increased; and they themselves were greatly increased in number, so much so that but little of the submucous connective tissue was visible, and the general appearances were those of an adenomatous growth. The ducts of the glands also were filled with a granular *débris* and proliferated epithelial cells, so as to obstruct them. The lymph-spaces were in many instances seen to be filled with granular matter; while the walls of the bloodvessels were infiltrated with cellular elements.

In the turban-like swelling of the crest of the epiglottis the same conditions were noticed under the microscope as were seen in the pyriform swelling of the aryepiglottic folds, with the exception that the glandular elements were not increased in number, and that the depots of inflammatory infiltration were smaller. The loose submucous connective tissue, especially on the posterior face of the epiglottis, was crowded with small cells of inflammatory origin. This latter appearance gives us an explanation of the horseshoe-shape the epiglottis generally assumes when thus affected. The thin and flexible cartilage at

the crest of the epiglottis is covered only by the mucous membrane and the submucous tissue, and the glands, which are not very numerous, are imbedded in the cartilage itself. If, therefore, this submucous connective tissue becomes distended by infiltration the fibres which encircle the cartilage become stretched, and act like the cord of a bow, bending the cartilage.

In the examination of ulcerated portions I have invariably found that suppuration began in the infiltrated glands and follicles, and that, although large in extent, these ulcerations were never very deep; that is, I have not found them to go below the submucous connective tissue, destroying the mucous membrane and the mucous glands, but no other or deeper-seated structures. In such cases, where ulcerations attack the epiglottis, however, we find an exception to this rule; for, because the suppurating glands are imbedded in the cartilage, the latter is also affected and destroyed, but not with such rapidity as the softer portions, and therefore an ulcerated epiglottis always presents a serrated edge; the projections being produced by the portions of cartilage not yet broken down, while the depressions are caused by the glands in the crypt having sloughed.

The depots of small-celled infiltration very closely resemble tubercular deposits; but only in a few instances have I been able to demonstrate undeniable evidences of true tubercle, namely, the presence of adenoid tissue and giant cells, and only in such cases where extensive ulceration of the mucous membrane was present.

These deposits, whether mere collections of leucocytes or real tubercles, are more frequently found in the lower part of the submucous connective tissue, and are but rarely seen near the surface. This fact and their small size would go to explain why we cannot see their evidences in the living larynx, and why many eminent authors deny the presence of tubercles in this organ.

Clinically, it has been observed that these lesions in the larynx bear a certain relation to the extent of the lung affection, so that the pyriform swelling is noticed in the earliest stages of phthisis often before physical signs show themselves.

The turban-like swelling of the epiglottis is observed when the lung-tissue has already begun to break down; and the ulcerations show themselves, as a rule, quite late in the course

of the disease, when a considerable portion of the lung has been destroyed.

And, again, we find that the pyriform swelling will in many cases disappear under general treatment in the same ratio as the lung affection improves. The turban-like swelling of the epiglottis rarely improves, while, when ulceration has set in, there is little hope for improvement either of the laryngeal symptoms or of the general health of the patient.

If we ask for an explanation of the fact that the larynx is thus affected in so many cases of pulmonary disease, we might expect the answer that it is because the larynx is, so to speak, in direct communication with the lung, because its mucous membrane is continuous with that of the bronchial tubes. But this, I do not think, is the real explanation. It is much more reasonable to think that, because we are enabled to inspect with comparative ease the larynx, we find changes there which probably occur at the same time in other organs of the body removed beyond possibility of inspection. I think we find in phthisis gastric symptoms as frequently as we find laryngeal symptoms.

But, no matter where we find the evidences of phthisis outside of the lungs themselves, they are caused by something which interferes with the free circulation of the part, and more especially with the free circulation in the lymphatic system. If such interference is once established, the capillary circulation of the part or organ must naturally be disturbed, and consequently congestion and inflammation will be the result, which in the case of the larynx is first communicated to the glands and follicles, as the parts best supplied with capillary circulation. Inasmuch as the lymphatic circulation is interfered with, absorption of the products of this inflammation cannot take place; and consequently we have a crowding of these inflammatory products in different parts, giving rise to the lesions already described.

OBSERVATIONS ON AURAL OR AUDITORY VERTIGO AND TINNITUS AURIUM, WITH DIAGNOSIS AND TREATMENT.

By LAURENCE TURNBULL, M.D.,
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In various forms of disease of the ear there are associated with the nervous paroxysm vertigo and reeling, with faintness and vomiting. These symptoms may be transient, as from syringing the ears, a sudden pressing of the fingers or speculum into the meatus, violent blowing of the nose, or sudden movement of the body, causing intra-labyrinthine pressure. No doubt other cases depend upon a plug of cerumen, bean, or pea filling up the meatus, or upon some prior disease or irritation of the auditory nerve in its expansion in the labyrinth, or upon some local blood-pressure or reflex disturbances. A still more severe form of aural vertigo is produced by chronic purulent otitis media with the presence of a perforation in the membrana tympani, concussion from firearms, producing a sudden, violent wave of air, which, striking the ears, causes a ringing with deafness and a feeling of vertigo, with a tendency in walking to fall on one side, from congestion and irritation of the fibres of the auditory nerve either by pressure or pulling them.

Another form, in which the patient is giddy when leaning too far backward or forward. Often this class of symptoms depends on contraction of the tensor tympani—a muscle which in action is associated with the masticatory muscles. In almost all these cases there is more or less deafness. There are four other varieties of vertigo which you are no doubt familiar with, and it is not necessary to enter into their symptoms at this time: they are (1), stomachic; (2), nervous, often from sexual exhaustion; (3), ocular; (4), epileptic. These four may be associated with aural or auditory; and great care must be given to be certain

of the diagnosis; but the occurrence of deafness will do much to assist us in arriving at a correct knowledge; and this should always be attended by a careful examination of the ears, and testing the hearing by the watch, tuning-fork, and Politzer's acumeter. Attention must also be paid to the limitation of the field of audition: to the loss of perception of certain notes, as recommended by Knapp.

The following are the conclusions, as to the *modus operandi* of the nervous symptoms of ear disease, by an able authority on diseases of the brain. "There are two sets of symptoms: (*a*), vital (faintness, perspiration, irregularity of the pulse, etc.); (*b*), locomotor (vertigo, with or without reeling)." He attributed the former to disturbance of, or actual disease in, the cochlear division; the latter to disease or disturbance of the semicircular canal divisions. The former division was, he suggested, chiefly afferent to the medulla oblongata, the auditory nucleus having close connection with the vagal and spinal accessory nuclei; the latter division, he thought, represented that part going, according to Lockhart Clarke, to the cerebellum. The vital and locomotor symptoms were due to disturbance of the medulla oblongata and cerebellum respectively. Pierret has recently spoken doubtfully as to the existence of relations betwixt the auditory nerve and the cerebellum. Cyon has recently found that irritation of each of the semicircular canals is followed by a particular ocular movement—a very significant thing towards the interpretation of auditory vertigo.

Dr. Edward Woakes, in his work on Giddiness, reports cases in which the auditory apparatus was previously quite healthy, but which may or may not be found affected after the attack. The author traces the connection between stomach-irritation and these attacks of vertigo, and considers them due to a reflex dilatation of the internal auditory artery, causing an increased flow of blood into the semicircular canals. Aural vertigo, the result of secondary inflammation of the labyrinth, is known as *Ménière's disease*, having received much attention from various authorities. Our ideas of its fatal character and the profound deafness as a result have changed because affections of the ears, with many of the group of symptoms before ascribed to this very serious malady, have been treated with success. But there is still another class of cases in which we have the complex symptoms of Ménière's disease associated with profound brain-symp-

toms from injuries of the spine, cerebral tumors, morbid growths of the auditory nerve, either of a fibrous character or true sarcoma or gummata, in which we have added the want of power of controlling the limbs, pain in the head intense and persistent, while the dizziness is increased, with nausea and vomiting, followed by paralysis.

These severe and distressing symptoms are associated with ear disease, especially of a chronic character; and we should be on our guard against being misled by such symptoms in our diagnosis and prognosis. As an instance of how trivial causes can produce Ménière's group, Moos relates the following case: "A peasant was sent to the ear clinic with the diagnosis 'Ménière's disease;' after the removal of a plug of wadding from the right ear, the vertigo, deafness, tinnitus, and vomiting disappeared entirely."

Dr. Henry D. Noyes reports Ménière's group of symptoms following parotitis, and believes that there was a metastatic inflammation set up in the labyrinth of the right ear, at the same time that a similar process took place in the testicle; the patient was totally deaf to all sounds in the right ear; when his eyes were shut in walking, he swerved to the left.[1]

In consequence of disease in the conducting apparatus of the ear vertigo may arise, and in such cases the only explanation is, that intra-labyrinthine pressure has called it forth. Gottestein has stated that we have no right to accept the term "*vertigo ab aure laesa*" of the neuropathologist (Charcot), because it remains to be shown whether, for a number of cases, the loss of equilibrium has its origin in the ear or brain. We, therefore, can only speak of Ménière's group of symptoms. This same authority agrees with us that there are two forms, the apoplectic and inflammatory. In a number of cases Gottestein found cerebral manifestations, loss of memory, aphasia, eye trouble, and complete destruction of the hearing power on both sides.[2]

Many of these forms of aural vertigo are readily detected and removed by the proper remedies; but what we have reference to is the persistent and sometimes painful vertigo, which is not always detected by the most careful physical exploration by one who is fully capable of doing so, and must be referred by exclusion to occur in pathological conditions of the middle ear

[1] Trans. Am. Otological Society, 1879, p. 342.

[2] Proceedings of German Association, Arch. Otology, p. 13, March, 1880.

or of the labyrinth, especially in apoplectiform deafness, or the otitis labyrinthica of Voltolini. This latter affection is one of the most frequent causes of deaf-muteism. Voltolini defines this affection as acute inflammation of the membranous labyrinth. Usually the disease sets in suddenly; the patient suffers from fever, has a hot and burning skin, and becomes uneasy and excited, with pain in the head; sometimes vomiting ensues, consciousness generally vanishes, either totally or partially, in the first twenty-four hours; at the same time the patient is very much excited and delirious, tossing about in bed; and in children violent screaming occurs. After from two to four days the patient becomes comatose; this condition lasts about two to four days, whereupon consciousness reappears. The child recovers its senses very rapidly, but when it first attempts to walk it is found to stagger. While the tottering gait gradually disappears deafness develops more or less rapidly. This is evidently a disease *sui generis*, and as the opinion of so distinguished and careful an observer as Voltolini has based this on a method of diagnosis we acknowledge, we cannot but receive his judgment until disproven.

I will now pass to the consideration of the details of some interesting cases, including almost all the varieties, one or two being of special interest and importance.

CASE I.—*Labyrinthine vertigo*, the result of inward pressure of the foot of the stapes on the endolymph, and retraction of the membrana tympani, with deafness to the watch when placed on the mastoid process region, but heard on the temporal bone. C. H. D., aged 50; residence, interior of the State of Pennsylvania; neither father nor mother living; the first died of dyspepsia, accompanied by vertigo and general debility, at the age of 79; he was deaf twenty years before his death. The mother died, at the age of 33, of puerperal fever. The patient states he suffers from chronic dyspepsia, with irregular circulation; and ever since he was a student, with periodical attacks of vertigo and vomiting, with torpid liver. He presumes the cause of his tinnitus and deafness to be chronic catarrh from exposure to cold. His former affections were several attacks of continued fever and one of typho-malarial fever, when surgeon in the army, in 1864–65. He has no pain, no discharge, but constant tinnitus for three months. His previous treatment was a prep-

aration of iron and strychnia, with an occasional blue pill, and a somewhat careful diet, avoiding meat.

Examination.—March 22, 1877. Meatus normal, good size, and not dry. Membrana tympani opaque, very concave, and handle of malleus very prominent; the middle ear yields dry auscultation sound. Eustachian tubes open, more narrowed in the right. The distance at which a loud ticking watch is heard on right ear was only 1½ inches; normal, 28 feet. H. D., left, 18 feet; normal, 28 feet. The tuning-fork heard opposite both ears; heard all the notes of a piano except the deepest. The loud ticking watch faint on occiput, not at all over the mastoid, but is heard over the temporal region. Tinnitus and deafness only occurred within the last three months, after a severe attack of vertigo, vomiting with fainting, and a tendency to reel to and fro. When in the railroad cars, cannot distinguish the roaring; when the meatus is closed it diminishes the sound. Cannot keep up conversation in a noise, or where there is any confusion. Has a mechanical difficulty in his nostril; the vomer was injured when a boy, causing slight catarrh. Has slight sore throat occasionally. Has a sister, aged 47, who has been deaf for about twenty years. Symptoms of pressure on the foot of the stirrup, and increased pressure on the endolymph of semicircular canals and cochlea.

Diagnosis.—Labyrinthine vertigo. Disease situated in the horizontal semicircular canals, for, when these are divided, it produces the movement of the head, as in this case, from side to side.

Treatment.—Under the influence of Siegle's exhausting speculum was very comfortable, and freer from the noises. Nitrate of amyl caused no headache and no flushing when the vapor was inhaled through the nostrils or injected into the middle ear by the Eustachian catheter. This patient had also disturbance of vision; and from the confirmed deafness the cochlea is involved, for, according to Flourens, when the cochlea was destroyed in animals they lost the sense of hearing, but not the faculty of equilibrium unless the semicircular canals were injured.

CASE II.—*Vertigo and Loss of Hearing of Certain Tones.* A gentleman from the South, after an attack of giddiness and sickness of the stomach, lost the pitch of certain notes; the

ears were apparently all right. The diagnosis was hemorrhage into the labyrinth or into the vicinity of the cochlea.

The single case of Dr. Cassell's, of Glasgow, Scotland, in which the whole cochlea was removed "by caries" without loss of hearing or impairing the perception of the transmitted tones of the tuning-fork, should not be set aside, or invalidate the report of a case of the removal of this portion of the hearing apparatus with entire and complete loss of hearing. Until we can have both experimental proof and a case like that of Dr. Cassell's, we shall hold on to the reasoning and experimental results obtained by Helmholtz, that the various fibres of the lamina of the cochlea respond to particular musical tones. Upon destroying the cochlea and the structures of the vestibule, Flourens produced deafness. We also know that, when one organ is lost, its power of performing its proper action is taken on by another, or a portion of another will perform its functions; or, as observed by Hinton, that the meatus of one ear facilitates the passage of sound to another; and on testing a case where the cochlea had come away two years before, the man stated he could not satisfy himself that he heard at all on that side.

Case III.—The following is of special interest in this connection: The derangement of hearing with which this form of vertigo is associated may be of two kinds. Sometimes there is evidence of undue excitation of the auditory nerve, noises in the ears, permanent or only at the moment of the paroxysm. More frequently, indeed almost universally, there is defective sensitiveness. This defect may be conspicuous or obscure; may range from a considerable degree of deafness to a slight defect in audition which it requires much care to ascertain. The knowledge that the defect may be limited to the perception of sound conducted through the bones of the skull is an important addition to our means of diagnosis. The fact was pointed out by the late Mr. Hinton (*Guy's Hospital Reports*, 1873), and by Mr. Dalby; and cases in which it was noted have been published by Dr. Ferrier, Dr. Duffin, and others.

The loss of what may conveniently be termed *perosseal audition* is regarded as evidence of an affection of the labyrinth or of the auditory nerve, and may be absolute. A tuning-fork, vibrating in contact with any part of the head or teeth, may be unheard

in the affected ear, while it is heard readily, if held opposite the meatus; or the loss may be partial, and in that case it may be detected by the method commonly employed by aural surgeons of closing the ears while the tuning-fork is sounding in contact with the vertex or some other part of the skull. Closure of the meatus, if the latter be unobstructed, increases the intensity of the sound; if the perception of sounds conducted through the skull be impaired, it renders it weaker or inaudible. But the method is one that requires much care and repeated examination to detect a slight defect in an unintelligent patient. It is important, however, to examine these cases, not only with a tuning-fork, but with the watch. There may exist marked impairment of perosseal audition to the watch, while the tuning-fork is well heard. This gentleman has been subject for several years to slight attacks of vertigo. The motion is uniform, a tendency to fall to the left. His hearing is acute; it was thought to be perfect. A watch placed opposite the ear is heard perfectly well; but the loudest ticking watch, pressed against any part of the head, is not heard in the least. The condition, however, is a variable one. At times, a watch in contact with the head is heard well; more frequently it is not heard at all. The liability to attacks of vertigo seems to correspond to the periods of imperfect audition. Whenever he has been tested after an attack, the power of hearing the watch has been always absent.

Even a slighter degree of impairment of the power of hearing of a watch in contact with the skull may be of significance, as is shown by the following case, in which the tuning-fork failed to reveal any abnormality in the function of hearing.

CASE IV.—"P. D., aged 56, admitted into University College Hospital, London, on August 15, 1876, had suffered during the last five years from startings on going to sleep, which lately occurred every night. Four months previously he had a blow on the head and on the bridge of the nose from the fall of plaster. In June (two months before admission) he noticed a considerable degree of deafness of the left ear, which continued for a fortnight, and then passed away. During the six days before admission, a considerable noise in the left ear was noticed. Twice during the preceding months, he had an attack of giddiness of short

duration, of which no definite history could be obtained. The day before his admission, while walking, he suddenly became giddy, as if he were turning round, staggered towards the right side and fell, as he says, in trying to recover himself. A slight sense of movement on his part and in surrounding objects continued until his admission. He then complained much of a 'confusion of sounds,' which seemed to be in his head, and of headache in the occipital region and behind the ears. His hearing at first seemed to be natural. A watch was heard a good and equal distance from each ear. A tuning-fork was heard at eight feet, and was well heard when sounding in contact with the head in various positions, and in each ear it was increased in loudness by closing the meatus. A watch was heard in contact with the head and on the right side; closing the meatus increased its loudness. On the left side, however, closing the ear rendered the sound less loud; but the watch had a double beat, and closure of the ear rendered one set of beats entirely inaudible. This result was obtained in every examination. (The patient was a very intelligent man, and his answers seemed reliable.) A few days after his admission he had another severe attack of giddiness, with great 'confusion of sounds in his left ear.' His rest at night was much disturbed, and he turned about in his sleep until his head came to rest at the foot of the bed. Sometimes he lay curled round, with his head hanging over the edge of the bed. If he were awakened and put straight, on going to sleep again he soon returned to the former position. Five days later he had another attack of vertigo, which continued in a slighter form for some hours, and some peculiar clonic spasm was noticed in his right arm and leg. He appeared able to control it when his attention was directed to it, but when his attention was otherwise engaged, the spasmodic movements went on, the right hand being continually jerked up and down so that the hand kept striking the epigastrium. At the time he said he felt as if he were falling through the bed or swimming about the ward, so that an effort was necessary before he could realize that he was in bed. During the height of the attack he complained of a continuous whirling or humming noise in both ears. A dose of chloral and bromide of potassium quieted him, and on bromide of potassium and iron he had no other severe attack while in the hospital."

CASE V.—*Aural Vertigo with Tinnitus. Old fracture of the spine.* (Much improved under the hydrobromic acid and ether.)

Feb. 12, 1880. J. K. G., aged 61, residing in the country, a widower; father and mother both died at over eighty years of age. The present condition of the health of the patient is feeble; has been a man of remarkable strength. In November, 1863, Mr. G. fractured the last lumbar vertebra, right side. This injury was produced by an exhibition of strength—lifting a barrel of vinegar upon a counter and again placing it on the floor. The fracture was not discovered, and he was allowed to move at intervals. Within two months symptoms of paraplegia manifested themselves; in fact, he was paraplegic for four years. Afterwards hemiplegia set in of the right side of three months' duration. First able to walk with crutches, then two canes, and lastly one cane, which now on going up stairs he pushes before him. He was kept in bed for years under the care of the late Dr. T. Betton and Dr. Gilbert. Within the first week in February was attacked with vertigo in bed, differing from the first vertigo which he suffered from his spine, which was an upward movement of the floor and a downward movement of the ceiling, and when he got out to walk, as if he was walking on a crust of ice. This last attack of vertigo was a whirling motion, with dizziness and an inclination to fall forward, and he was, during each attack, in a profuse perspiration.

Examination of the ears, etc.—Left ear affected; hearing distance three inches with his watch of twenty inches normal distance. The presumed cause of the disease of the ear catarrhal; no pain; tinnitus aurium in left ear is pulsating; right like a sea-shell. The pulsating was synchronous with the heart, which was hypertrophied. Previous treatment: nasal douche with chloride of sodium, half a drachm to the pint; to the throat, which was ulcerated, cupri sulph. twenty grains to the drachm of water, applied with a brush; ulceration of nose, applied twenty-grain solution of argenti nitras, with diluted ointment of nitrate of mercury. This treatment benefited the right ear and suspended the tinnitus which there existed; meatus irritable, but right contained cerumen; membrana tympani opaque and sunken with irregular umbo, with adhesions; right less opaque, not so sunken = H. D. Left acumeter nine inches; right acumeter, normal; tuning-fork in air, forehead, occiput, and top of the head. No member of family deaf.

Diagnosis.—Thickening of the membrana tympani with adhesions, with vertiginous symptoms on pressure of right ear; obstructed Eustachian tube of left side opened by use of Politzer's bag with vapor of hydrobromic ether.

Treatment in consultation with his physician.—Daily inflation with Politzer's bag charged with the vapor of hydrobromic ether; also, ℞. acid. hydrobromic. (Squibb's) f℥j. Sig. Ten drops in a wineglassful of sweetened water three times a day, with a tablespoonful of maltine in milk at bedtime.

Feb. 17. No return of the vertigo since he began the treatment. Hearing distance improved to one foot on left side. The hydrobromic acid caused too much action of the heart, and had to be reduced to five drops.

21*st.* Still no return of the vertigo; noises much less; a great feeling of weakness in the morning on attempting to get up. Directed to take hot tea before attempting to rise; much relieved; able to resume the acid in ten-drop doses as before.

24*th.* Patient still improving; hearing better, he states; on testing, find the improvement continues, less of the noises; very cheerful and bright.

May 17. No return of the vertigo; able to walk with more vigor; very slight tinnitus aurium; appetite good; digestion all right, and sleeps well; able to walk out of doors.

The gastric symptoms are especially liable to mislead. In the cases already reported, and the following are admirable illustrations from Dr. Hughlings Jackson.

"A gentleman suffers from frequent attacks of intense dyspepsia and vertigo, the former appearing to him to precede and cause the latter; the vertigo is sudden and violent; he has fallen, and would fall always if he were not careful. He cannot say to what side he falls; but on one occasion must have fallen to the right, as he grazed the right side of his face. He is almost completely deaf on the right side; a watch in contact with the skull on that side is quite inaudible. The hearing on the other side seems unimpaired. The deafness came on gradually about twelve years ago. He has been subject from boyhood to attacks of violent dyspepsia, with vomiting and prostration; in his youth they were as severe as they are now; but he never suffered from vertigo until the onset of his deafness. Since that time the dyspepsia and vertigo have gone on together. The paroxysms of vertigo in his case appear dis-

tinctly to be excited on the attacks of gastric disturbance; they are produced by errors in diet, and the long liability to such dyspepsia indicates that it is not to be regarded as secondary to the aural affection; but the sequence of the symptoms, the coincidence of the liability to vertigo and of the ear disease, indicate clearly that the giddiness is ultimately due to the influence of the latter, although it is excited by the stomach derangement."

VERTIGO.

According to the experience of Prof. J. M. Charcot, *vertigo*, in about three-fourths of the cases, is one of the phenomena which mark the invasion of multilocular sclerosis of the nervous centres. From the descriptions given by his patients, the vertigo was generally of the gyratory kind. All objects seem to be whirling round with great rapidity, and the individual himself feels as if revolving on his axis, threatened with loss of equilibrium. The patient lays hold of whatever is nigh him. In most cases, this giddiness returns in fits of short duration; sometimes, however, it presents itself, almost without interruption for a certain period, superadded to the tremor and paralytic state of the member; it often contributes considerably to render it almost impossible for the patient to stand erect, or continue his titubating walk. You must take care, he states, not to confound this titubation with the uncertainty of gait, in connection with diplopia; the latter ceases when the patient keeps one of his eyes closed.[1] Thus vertigo and diplopia having suddenly shown themselves, paresis and titubation may in a few days, so that the disease, multilocular sclerosis as it were, is immediately established (p. 174). Sometimes the invasion is inaugurated by an apoplectiform attack, preceded for some days or weeks by vertigo and cephalalgia, and followed by temporary hemiplegia. Vertigo is also found in certain forms of epilepsy, and is termed epileptic vertigo, and is never found in hystero-epilepsy; and the initial cry of the epileptic is wanting. The diminution of persistent vertigo, greater resistance to fatigue, and more sustained continuity of movement are important indications of improvement.

Treatment.—To relieve the persistent neuralgias, frequent

[1] Lectures on the Diseases of the Nervous System, delivered at La Salpêtrière. By J. M. Charcot. Translated by George Segerson, M.D., of Dublin. Phila., Henry C. Lea, 1879, p. 159.

pollutions, etc., nothing has yielded such good results as the bromides; in such cases, hydrobromic acid will take their place, and relieve the reflex excitability, etc.; 15–30 drops, in conjunction with quinine, strychnia, and morphia. The bromides will produce in certain patients redness and paralysis of the pharynx, coryza, urinary hypersecretion, and diarrhœa, but, above all, weakness of the limbs. Hydropathic treatment, warm water, 24° to 28° C., is well borne, and the neuralgias, spasms, and distressing sensation of cold will sometimes disappear. The *acoustic nerve*, according to Topinard, was affected in one hundred and two cases; hearing was affected ten times; and Rosenthal observed disturbance of audition in five cases (enfeebled hearing upon one side). In the majority of cases, the patient complains of annoying noises in the ear, which often prove intractable to treatment. Lucae and Politzer observed a lesion of the semicircular canals; the first in a case of gray degeneration of the posterior columns, and the other in a case of tuberculosis.

INTERESTING CASES OF TINNITUS AURIUM FROM ALCOHOL AND TOBACCO SUCCESSFULLY TREATED WITH HYDROBROMIC ACID AND HYDROBROMIC ETHER.

CASE VI. Dr. M. I., aged 35, a physician of extensive practice, became distressed in mind, owing to a persistent tinnitus aurium. He consulted several of his medical friends, had his heart examined, etc.; also one or two who made aural surgery a special study. They could find nothing in his ear, except a slight catarrhal inflammation, which, after a time, passed away under treatment. Still, the noise continued night and day. He had been taking at times a glass of beer, and occasionally a glass of wine; this was changed for red wine when much exhausted. He was advised to try the hydrobromic acid, nitrite of amyl, bromide of potassium, and various other agents; but this all proved of no avail. At last, he was directed to take hydrobromic acid, and to stop beer, wine, etc., absolutely. This course he kept up for a month, and gradually all the noises disappeared.

CASE VII. Dr. J. N. K., aged 45, by occupation a physician and superintendent of a large institution, married, both father and mother living, and his general health vigorous. His left ear affected with slight deafness; the noises are constant, like letting off of steam; has been treated by washing out the meatus by means of glycerine, warm water, etc. Examination:

meatus normal, membrana tympani sunken, reflex impaired. Eustachian tube of left side opens with an effort; middle ear contains no fluid. Hearing distance, left 7 feet, right $7\frac{1}{2}$ feet; acumeter, 13 centimetres on left, 16 centimetres right. Tuning-fork not heard better when both ears are closed about the same in the air, when both meatus are open. Irritability of left nostril, throat, naso-pharyngeal spaces, hyperæmic; never suffered from severe illness; no member of family deaf. Has found himself very irritable in temper, which is a very unusual thing with him. The noises were so loud and persistent that the doctor would call the engineer and inform him that he was sure steam was escaping. He heard also the noises all night, when on a visit to another institution, like the motion of the belt. On making an examination of his heart, found the second sound irregular, and firm pressure on both his carotids stopped the noises temporarily. On an examination of his diet, he took a certain small amount of wine; also, when a certain friend was with him, he would indulge in smoking to excess. The stimulant and narcotic were absolutely forbidden, and the middle ear was inflated, and hydrobromic vapor blown into the left Eustachian tube, by means of the catheter. Internally, hydrobromic acid, tincture of aconite to quiet the heart, and maltine. He reported in a month's time that the noises had disappeared entirely.

Case VIII.—G. W. S., aged 34 years, occupation a student of medicine, mother and father both living, his general health very good. Both ears affected, but the left is most affected. The duration is nine or ten years. The presumed cause, as given by the patient, that it was trouble from his throat. Has no pain, but a constant and distressing pulsating noise in one ear, and a ringing at intervals in the other. Has been under treatment by a distinguished aurist of Boston; employed local agents to the throat, Politzer's air douche, etc. Examination: meatus normal, membrana tympani dull, thickened, and sunken; Eustachian tubes pervious, left much narrowed. H. D. right ear 2 inches, left 1 inch. No obstruction in nostrils, granular pharyngitis, mother and sister deaf. Diagnosis, chronic aural catarrh. Treatment from October 14 to November 14, air douche, iodine vapor, and tincture of iodine, post-aural apparatus. No decided improvement from this course. The following was instituted: the introduction of the Eustachian catheter and air-

bag, so as to exhaust mucus from the tube; he has had a constant feeling of fulness on that side. The middle ear was also inflated and injected with a warm solution of borate of sodium, glycerine, and water. The treatment was followed by rest, and use of maltine as food. Tincture of aconite to quiet the action of his heart, and the use of hydrobromic acid (Squibb's) three times a day. This treatment has entirely relieved the pulsating tinnitus, improved his hearing, and relieved his distress. January 3d was his last visit, and this was his report. The patient, of the impression that the exhausting of the middle ear was the first means of relief which he received, and the use of rest and relaxation from intense study; the hydrobromic acid also acted well, except now and then it would increase too much the action of his heart, then a few drops of tincture of aconite would relieve this sensation.

Case IX.—J. F. S., aged 45, a distinguished bishop of the Catholic Church, brought me the following note from Hugo Engel, M.D., Lecturer on Electricity, Jefferson Medical College, etc., desiring me to take the case totally under my charge:—

Nov. 27. *History.*—General condition of health fair; very much exposed, travelling often night and day. The hearing in his left ear has been impaired since childhood, but no pain or discharge for many years; recently the left ear became so troublesome that he had to apply to his physician for relief. His physician had been improving his general health, which owing to exposure to malaria, had affected his whole system, but since the treatment he was better, and thinks his health now good. The chief distress is a constant snapping noise.

The following is the condition of the parts on examination: meatus normal but dry, but with little secretion of cerumen; membrana tympani of left side sunken and adherent; Eustachian tube not open by Valsalva nor Politzer, but by the use of the Eustachian catheter and chloroform vapor, but no influence on the noise. No fluid or hardened mucus or pus in middle ear; Politzer's acumeter heard close to the ear; loud ticking watch fifteen feet, normal distance three inches right; voice elevated in tone when right ear is closed. No obstruction of nose; hoarseness at times in church; uvula elongated and dropsical; this elongation was treated by astringents, etc., but not being relieved the elongated point was removed and a powder

of tannin and iodoform employed by the patient with entire relief to the loss of voice, which was no doubt owing to mucous plugs on the larynx falling down on the vocal cords. On rhinoscopic examination no ulceration of the orifice of the tube, which was only covered with adhesive mucus. No organic heart trouble or disease of any vessel.

Diagnosis.—Slight adherence of the walls of the Eustachian tube; irregular action of the tendon of the tensor tympani muscle, with evidences of anæmic thinning of the blood. Inflated the middle ear with hydrobromic ether and directed twenty drops of the hydrobromic acid (Squibb's) three times a day in sugar and water as a lemonade; employed dialysed iron, from ten to thirty drops; diet, a tumbler of warm milk at night instead of porter or ale, with a tablespoonful of maltine; slight counter-irritation by tincture of iodine at the base of the ear, as there was a slight pain. This treatment was kept up, the patient attending somewhat irregularly, when each time inflation of the tube with the ether, and by Feb. 9 all the distressing symptoms had passed away and he found he was perfectly well. Was directed to continue his medicines in diminished doses, and to keep up the extra nourishment, as his duties were a continual drain upon his nervous system.

CASE X. *Tinnitus aurium for five years, constant ringing of bells.* —*Feb.* 6, 1880. Margaret P., aged 10 years, a bright intelligent girl; she is at school, but labors under great difficulty in acquiring her lessons, owing to her deafness. Both ears are affected, but the right is the most affected—duration since childhood. With the exception of cold and intermittent fever there was no known cause. At times she suffers from pain and constant ringing of bells. Has been under the care of a physician, but made no progress. The discharge from right ear is constant and of a yellow color; meatus of right ear very irritable, with polypoid granulations; left is also irritable; membrana tympani of right perforated and thickened; left only thickened and drawn inwards; Eustachian tube of right closed; of left open, but narrowed. Loud-ticking watch heard on contact of right; left, two inches; tuning-fork heard on temple, forehead, and top of the head. Nose swollen and turbinated bone inflamed; has nasal catarrh; tonsils of both sides enlarged and pressing on the orifices of the Eustachian tubes; posterior portion of pharynx

covered with granulations; voice muffled and nasal; very nervous. Father is somewhat deaf; mother is delicate in health.

Diagnosis.—Chronic otitis media, with ulceration and polypi.

Treatment.—Cleansing ear; use of sulphate of copper to ulcerations, powdered boracic acid, inflation of middle ear, etc.; improvement gradual, but damp weather caused always an increase of the deafness, owing to the swelling of the uvula and tonsils; these were removed under the anæsthetic influence of hydrobromic ether. She was placed upon maltine and dialysed iron; also a mixture of hydrobromic acid, glycerine, and water, for the noises. She has been under treatment for a month with great improvement of the hearing and the disappearance of the noises.

Use of Hydrobromic Acid and Hydrobromic Ether in Tinnitus Aurium and Vertigo.

For about two years I have been testing the use of hydrobromic acid both in cases of diseases of the ear, also in cases in which I considered it useful in certain nervous diseases of a part or of the whole nervous system. The first preparation which I employed was made by the formula of Fothergill, which has been the most generally employed. It is given in his "Handbook of Treatment," Amer. edit. of 1877, p. 569. This formula, according to Dr. Edward S. Squibb,[1] is loose and inaccurate, yielding a complex solution containing much tartaric acid and potassium, and only containing between eight and nine per cent. of hydrobromic acid, and as the dose is stated to be f℥ss to f℥j, by weight, it is only equivalent to four to eight grains of potassium bromide. During 1878 and part of 1879 I used many ounces of this preparation, obtained from one of the very best drug houses in Philadelphia; but I could only say that I derived benefit from the drug in a very few cases—some twenty-eight cases out of one hundred. . . . After I visited Dr. Woakes, of London, who introduced the drug into use in the treatment of certain forms of tinnitus aurium, I told him of my want of success, and he informed me that he had also a like difficulty with certain forms of the acid sold in London, and when he obtained a strong and pure article his success was very gratifying. On my return home I had a consultation with Mr. Charles Bullock, the able chemist, of this city, when we discussed the subject,

[1] Notes on Hydrobromic Acid, pamphlet, p. 11.

and he advised my employing that made by the most accurate process, as described by Dr. Squibb in the pamphlet before referred to, which he kindly sent me. The formula and process for making an acid of the proper strength is as follows:—

Take of potassium bromide six parts;
Sulphuric acid, seven parts by weight, sp. gr. 1.838 at 15.6° C. (60° F.)

Add to the sulphuric acid one part of the water and cool the mixture, then dissolve the potassium bromide in six parts of the water, add the diluted sulphuric acid, and set the mixture aside for twenty-four hours to cool, when a decomposition takes place into hydrobromic acid and the sulphate of potassium. I will not go into all the details; suffice it to state that a troyounce of the acid obtained by this process contains exactly 400 minims (401.48 +), and the fluidounce of 480 minims weigh almost exactly 574 grains (573.8 +); a drachm of it, therefore, would contain 50 minims, and would be the bromine equivalent of 30 grains of potassium bromide. A gramme of the acid is equal to 12.86 minims, and therefore 4 grammes would be 51.44 minims, equal to 30.86 grains of potassium bromide—a very large sedative dose. The doses of the acid I find are much less than that required by the potassium bromide. In most of the cases I commence with ten drops in ten teaspoonfuls of water and one tablespoonful of sugar, which makes a pleasant lemonade and is gratifying to a feverish patient. I increase the dose gradually until I arrive at thirty drops, when, if the headache or vertigo or epileptic convulsions are not relieved, and I find some disturbance of the heart's action, I either diminish the dose or employ in conjunction small doses of tincture of aconite until the heart is relieved. In some cases I combine the potassium bromide with the acid when the urine indicates too much acid in the system, or it produces too much irritation of the urinary passages. In a case of great debility with severe vertigo, I advised the combination of the acid with lithium bromide, which salt contains nearly ninety per cent. of bromine, or more bromine and less base than any neutral salt. It is suggested by Dr. Squibb to saturate the acid with lithium carbonate and adjusting the volume of the solution to the dose required. But experiments bear out the idea that bromine when combined with hydrogen proves more active than when combined with potassium. The

acid as made by Squibb's process, is half the bromine strength of the salt, or thirty-four per cent.

I reported twenty-five successive cases of "tinnitus aurium" at the meeting of the Section of Otology of the British Medical Association at Cork. Since that time I have added the above cases, and one successful case of treatment of tinnitus aurium was reported to me by Dr. C. K. Mills, of this city, under the use of hydrobromic acid, and one in which it at first benefited and then the case relapsed. In a case of tinnitus aurium in which there was the distressing symptom of vertigo, large doses of the hydrobromic acid were employed without benefit; but the post-mortem revealed a tumor involving the auditory nerve. I feel sure that the action of the potash salts has a tendency to break down tissue, and to cause the impairment of function of the muscles of the lower extremities ascribed to the bromide of potassium. The physiological action of free bromine is a corrosive irritant to the stomach, producing pain, vomiting, diarrhœa, and death by exhaustion; on dissection the mucous membrane of the stomach and bowels is found softened; while the action of poisoning by a solution of potassa are acrid and caustic taste in the mouth, burning in the throat, nausea, vomiting of alkaline, bloody matters, diarrhœa, convulsions, delirium; while in long continued doses it diminishes the coagulability of the blood, with passive hemorrhages, and general weakness and emaciation.

Case XI.—*Feb.* 22. B. H., a young lady, aged nineteen, suffering intensely with an attack of scarlet fever with intense cephalalgia, which was not relieved by hot foot baths, active movement of the bowels, cooling lotions, etc., to the head, was directed the hydrobromic acid in ten-drop doses, as before recommended, as a lemonade. After the use of six doses, entire relief to the symptoms, able to open her eyes, and a large, long clot of blood was discharged from the nostrils.

Case XII.—J. W., aged eighteen, subject to vertigo, tinnitus aurium, and middle ear catarrh, with pain in the head, at times so severe as to disturb her mind and memory. Employed in her case the various means to relieve her middle ear catarrh, and administered thirty-grain doses of potassium bromide, with no improvement in the vertigo or tinnitus aurium for two months; also during another month chloroform, nitrite of amyl, ordinary

ether, and even hydrobromic ether, were all employed, with but slight improvement from the latter agent. When I placed her upon fifteen minims of hydrobromic acid, three times daily, as a lemonade, when the dose had been increased to thirty minims, and she was fully under its influence with the hydrobromic ether, all this noise disappeared. This was one of the cases in which Fothergill's acid was employed, and I am pleased to state that after one year the relief in this case was permanent, as she so reported in person.

CONCLUSIONS.

1st. Most of the cases of Ménière's symptoms of disease are of a secondary nature, and are due to inflammatory processes within the tympanum, or mastoid cells.

2d. In the majority of the cases, the rotation, according to the most recent investigations, is toward the affected side, the attack usually lasting from two to thirty minutes, but in some cases from one to two days.

3d. These attacks are often accompanied with tinnitus of a painful and pulsatory character, and are relieved by the use of local measures and hydrobromic acid.

4th. The symptoms of tinnitus, giddiness, headache, etc., can all be relieved without entire loss of hearing except in a few rare cases.

5th. Local treatment is often successful if, according to Dr. A. Guye,[1] the cases are not of too long standing.

6th. In 1874 M. Charcot, of Paris, recommended the dotted actual cautery over the mastoid process, and sulphate of quinine in doses of ten to fifteen grains daily in inveterate cases of Ménière's disease.

[1] Paper read before the Otological Section of the International Medical Congress at Amsterdam, Sept. 9, 1879.

MINUTES OF THE SECTION

ON

DISEASES OF CHILDREN.

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ON

DISEASES OF CHILDREN.

THE Committee of Arrangements, by request of Dr. A JACOBI, of New York, and others, set aside a room for the subject of Diseases of Children, and appointed several papers to be read. On June 3, 1880, the Section met and organized by electing Dr. S. C. BUSEY, of the District of Columbia, Chairman; and Dr. FRANK WOODBURY, of Pennsylvania, Secretary. An amendment to the by-laws creating a permanent section was ordered to be presented, and recommended by the chairman to the general session. This was done the next morning, June 4, 1880, when a resolution was unanimously adopted, establishing a permanent Section on Diseases of Children, to be known as Section VI.

The following papers were read before this Section:—

An address on *The Claims of Pædiatric Medicine*, by A. JACOBI.

Bright's Disease in Children caused by Malaria, by Dr. S. C. BUSEY.

Congenital Multiple Lymphectasia, by Dr. JAS. C. GREEN, of New Jersey.

On Congenital Atrophy of the Liver, by Dr. A. JACOBI.

A Case of Supra-Pubic Lithotomy, by Dr. A. JACOBI.

These papers were all of an interesting and practical character, and were discussed by Drs. E. W. SCHAUFFLER, of Missouri, J. B. REYNOLDS, of New York (by invitation), H. A. HOPPER, of New Jersey, E. A. CAREY, of New Jersey, and the officers of the Section.

FRANK WOODBURY, M.D.,
Secretary.

AN ADDRESS ON THE CLAIMS OF PÆDIATRIC MEDICINE.

By A. JACOBI, M.D.,

NEW YORK.

The thanks of this new Section, still provisional in character, are due to the Committee of Arrangements. If any branch of medical service deserved particular consideration, it was the development of the physiology and pathology of infancy and childhood. In fact, the separation of this department from universal medicine, when the meetings of the Association are large, and real progress is an object in view, is a necessity. While making this remark, I am well aware, however, that it may be suspected to initiate an inconsistency on my part, for both in private and public, both individually and officially, have I protested against the exaggerated specializing tendencies of the times. When I did so, I alluded to facts within the knowledge of all. We are surrounded by specialists of all sizes and regions. The human body is held no longer to be an organism, but a conglomerate of organs which have no connection with each other. One man doctors the eye as another plays on the violin; another the larynx, as one plays the harp; another on the rectum, as one handles the bass. Eyes are by this time a recognized specialty, the practice on which requires a great deal of practical skill and dexterity. The ears have been thrown in, as, though the diagnosis of their diseases has made great progress, their medication and other treatment is, in many cases, rather a thankless task. Nose, throat, and larynx have been conquered as special property. Lungs and heart are also claimed as such; the urinary organs are invaded by specialists; the sexual organs of the male are the field of operation on the part of specialists; the sexual organs of the female, with their appendages, are sacred property of another class, and these appendages are said to extend from top to toe; the skin, this fourteen square feet domain, is no

longer subject to the general practitioner; the hair is coveted by one specialist, corns by another, nervous diseases by this, rheumatism by that specialist. What is left for the general practitioner? The general practitioner will in future be wise in claiming, as the legitimate province of his practice, nothing except the male half of mankind, and very old women, and very young children, provided he will keep his hands off their eyes, ears, nervous systems, lungs and hearts, urinary organs, venereal diseases, nose, pharynx, larynx, skin, hair, and corns.

This looks very ludicrous, but still you admit there is a great deal of truth in it. The first cause of this dividing-up process was certainly the progress made in most branches of medical science and art which was such as to prevent the individual practitioner from keeping up with the time, and to lead different tastes in different directions of study, and after that—of practice. This is legitimate. But the second cause lies in the actual or alleged facility of accelerating success, both in obtaining skill, dexterity, reputation, and money. As soon, however, as worldly success is placed at the top of the ladder of a young man's ambition, nothing but *this* success is aimed at. We have, both here and in Europe, a number of specialists who deserve, beside their pecuniary results, the reputation they have earned for their knowledge and skill, and the progress medicine owes to their exertions; but the large class of specialists are unfortunately not of that kind. To claim special knowledge is not to possess it; to have attained a certain manual dexterity in handling an instrument is not science; to know how to examine an *organ* in artificial light, and to have obtained a certain degree of skill in operating on it, is not knowing the organism. The specialist ought to be the final development of a medical man, who, after mature general studies, and, if possible, extensive general practice has prepared himself so as to be able to circumscribe the *extent* of his study and practice, in order to render them more *intense.* Instead of that, it is a common experience to meet with young men just from college, even in college, who consider themselves the equals of such specialists as I have spoken of by merely refusing to study or practise anything else but just that "specialty." Great specialists are almost as rare as great general physicians. The superficiality and wantonness displayed in the constant new formation of specialists in practice will I hope not last much longer. Both the profession

and the public will more and more understand that, though a shoemaker can cobble the sole of your shoe, and your watchmaker can detach the spring of your watch and repair it separately, the human organism cannot be cobbled in isolated parts; an *organism* it is, and not a *machine.*

But there is a difference between special practice and special study. A young man who would propose to practise on children as a specialty, would make himself ridiculous. Do not believe that this is an impossibility or the invention of my imagination; for, but a few months ago I was applied to by a young medical man in France, who inquired what were his chances in setting himself up in New York City as a consulting physician for diseases of children. But a young man, or an old man, who while studying his profession in general, would study diseases of children in particular, hear lectures on that subject, read books and monographs, search the journals for information, study the anatomy and physiology of the young even more than those of the adult, he would, if anybody, deserve the name if he cared to have it, of a specialist, by his labors, and not by unwarranted claims. As far as practice is concerned, my own belief is this: that the diseases of children must never be torn away from general medicine. It is true, however, that I do not believe that because the young patient cannot complain of malpractice any more than the dumb brute, every ignorant practitioner ought to be let loose with impunity on the unsuspecting baby, with his diagnosis of dentition and worms, or malaria, and his calomel powders. What I believe and urge is this: that the general practitioner should avail himself of every means and source of *special study* and information, such as is afforded in special courses, in clinics, hospitals, the literature of the subject, and in such societies and special sections as this one is hoped to be at a future period.

The pathology and therapeutics of infancy and childhood do not mean the very same things in adults, they mean more than merely reduced ages and doses. The modern studies in anatomy and physiology, and more than all, in embryology, have worked great changes. A large number of malformations have been recognized as arrests of development, others as the result of disease at an early stage of normal evolution; and a large class of diseases are the result of abnormal development after birth. The diseases of the bones find their explanation mostly in the

ever-changing condition of their very growth, particularly those of the epiphyses; osteitis, simple and multiple, hip diseases, multiple exostosis, belong to the young mostly, or depend on processes traceable to childhood. The large class of rachitical deformities and processes—as far as the bones are concerned, often mistaken for osteomalacia, formerly—cannot be explained by conditions common to all ages; the peculiarities in the diseases of lymphatic glands; the intestinal catarrhs; the typhoid ulcerations; meningeal symptoms, such as depend on conditions exclusively found in the young—for instance, craniotabes, premature ossification—the peculiar symptoms and pathology of spasm of the glottis; the various types of constipation not found in advanced age at all; the peculiarities in the appearance and course of pulmonary inflammations; the diseases of the newborn, from the eye to the umbilicus; the differences in the appearance of zymotic diseases in the young;—all of these, and their number might be increased at pleasure, prove to what extent a special study of the diseases of children is required.

In regard to that we happen to live at a very favorable time. The purely anatomical period as created and represented by Rokitansky, Skoda, Billard, Bednar, and Rilliet and Barthez, indispensable though it have been, and full of blessings for the development of medicine, has happily passed by with its one-sidedness. The functional disturbances of infancy and childhood are so frequent that the physiology of that early age has great claims on the experimenter and investigator. The text-book of Alleix, Vierordt's great essay on the physiology of infancy and childhood, in Gerhardt's Manual, first vol., exhibit a large accumulation of facts and give the direction to future works. Special studies, such as Martin and Ruge's on the urine of infants; Jurasz's and Epstein's on cranial murmurs, etc. etc., will be repeated, improved upon, and imitated in other fields. The chemistry and physics of the young organs have already been the subjects of many accurate investigations, and the number of good observations, both anatomical and clinical, is very great indeed, and increases daily to such an extent that the doctrine of diseases of children has been established on a firm basis of its own.

A special section on the pathology of children will, however, not only give its attention to the sick, but to the well child. The questions of how to nurse and how to feed, both naturally

and artificially, cannot claim to be fully answered to the satisfaction of all. We need not wonder at the uncertainty on these important points amongst the public when, though much has been settled, so much is left to doubt, uncertainty, or even ignorance, in the profession. Nothing is more vital to the raising of the baby than its hygiene, which comprises more than feeding alone, and has to pay attention to dress, air, sleep, bath, and exercise, both physical and mental. Every one of these topics requires repeated discussion. As to feeding alone, we know that 20 per cent. of all children born alive die before they have completed their first year, and the majority of these 20 per cent. die of diseases of the digestive organs. But not only mortality has to be reduced by sound principles of hygiene. It is not enough that 80 per cent. should survive their first year, it is necessary in the interest of both the young individual and the commonwealth that they should be in good health and prepared to resist unfavorable influences. For life is not the greatest boon unless it be united with health. The hygiene of infancy has to secure a vigorous skin, active lymphatic glands, and normal viscera. It has also to supervise the curricle of later years. The determination of the age at which a child ought to be sent to school, and the best mode of instruction at school, belong to the domain of such a special section as it is proposed. And when after all, in the course of untoward events and hygienic errors the young fall sick, the care of the patient, both in private and in public institutions, presents itself for consideration. The topics of children's hospitals and sanitaria suggest themselves as fit subjects for the deliberation of the thoughtful and experienced, not only for the immediate benefit they confer upon the suffering, but also because of their being the only places where certain systems of treatment, such as the antifebrile and antiseptic, can be most successfully applied and tested; and where, finally, the honest searcher for truth in the profession, whether student or practitioner, or even the professional nurse, can alone find the opportunities for observation and instruction.

These are some of the considerations which speak in favor of the establishment of a special pædiatric section. Pædiatric science is no longer, ought no longer to be, a simple attachment to obstetrics and the diseases of women. It has nothing whatever in common with these latter branches. It has but little

quite in common with general pathology and therapeutics. Thus a sound theory postulates a special study in a special section. And practice asks for it more than theory itself, for the majority of the general practitioner's patients are infants and children, with a symptomatology of their own, diseases of their own, and therapeutics adapted to their special requirements.

CHRONIC BRIGHT'S DISEASE IN CHILDREN CAUSED BY MALARIA.

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In a contribution to the *American Journal of the Medical Sciences* (vol. lxv. p. 123, 1873) I reported several cases of renal disease occurring in children, and believed to have been caused by chronic malarial poisoning. These cases, with one exception, were acute forms of disease, which I thought were curable. In supplementing that contribution I submit the report of three cases of the more chronic and incurable forms of renal disease.

Malaria has been recognized by most authors on kidney affections as an occasional cause, but no one has offered a satisfactory explanation. The general opinion is that the renal disease is secondary, and the immediate effect of blood impoverishment, which is always a characteristic of the malarial cachexia. Whatever may be this relation of cause and effect, one fact is exhibited in all the cases which have come under my observation, that is, that renal disease only occurs as a complication or sequence of miasmatic diseases in those cases which have been either neglected or imperfectly treated. The history of every case shows that the periodic attacks recurred at shorter or longer intervals for a period of several months or years, proving conclusively that the treatment, if any, had been limited to the arrest of a paroxysm or to the interruption of their regular recurrences for a brief period. It is not surprising that cases thus neglected should terminate in some serious organic disease of the liver, spleen, or kidneys. These results are, perhaps, more properly attributable to the blamable neglect of the patient, rather than to any relationship of cause and effect subsisting between miasmata and renal disease.

Another point, of special interest to the clinician, refers to the proper management and medication of the chronic forms.

Cure may be beyond the resources of science, but life may be prolonged for an indefinite period. How best to accomplish this is the important consideration. As a contribution to this branch of the subject I offer the following reports, together with the details of the treatment of each case, and a general summary of my experience in the therapeutic management of similar cases of chronic renal disease.

CASE I.—Harriet R., aged thirteen years, white, admitted to the Children's Hospital, June 30, 1877. Had never had scarlet fever. Two years before a sister and, in August, 1876, her mother had died of dropsy. Six months previous to admission Harriet had chills, which were followed by swelling of the lower extremities and abdomen. Under treatment, these swellings had disappeared. Now has ascites and general anasarca; enlargement of the liver and spleen. Urine passed, 12 ounces. The analysis was omitted from the record. This patient remained in the hospital until September 30, 1878, when she absconded in apparent good health.

At first the treatment consisted of a nutritious diet, a diuretic of sweet spirits of nitre in infusion of juniper berries, and the citrate of iron and quinine; but the anasarca increased, and on August 1st 15 grains of jaborandi were given in infusion three times a day, followed by considerable increase in the quantity of urine, and the gradual disappearance of the fluid accumulations. This, so far as I know, was the first time this drug was administered in such a case. During her long residence in the hospital, it was several times given upon the reappearance of the œdema, with the same good effect. On two different occasions the blatta orientalis was employed with the effect each time of diminishing the amount of urine. At five different times she suffered from uræmic intoxication, which was preceded by a most remarkable dilatation of one, usually the right, or both pupils, and followed by great irritability lasting for a few hours, then screaming, and terminating in unconsciousness. These attacks were always speedily relieved by free diaphoresis, produced by a hot air bath, which was accomplished by packing about her person under cover a number of bottles filled with hot water. As they cooled they were refilled and reinstated, so that a continuous high temperature was maintained as long as desired.

During her stay in the hospital she passed safely through an attack of measles.

CASE II.—John O'L., aged 10 years; white; admitted to Children's Hospital, March 22, 1880. (Notes by Dr. S. S Adams, House Physician)

Four years previously was taken sick with chills, which had recurred, at shorter or longer intervals, sometimes assuming the tertian and sometimes the quotidian form. During the summer of 1878 he was seized with cough, which still continues. After an attack of chills in the fall of 1879, his face began to swell. Since Christmas last he had continued to swell. Now both lower extremities are enormously enlarged, the anasarca extending upwards, covering the abdomen and back. Some puffiness under both eyes. Until recently appetite good; bowels constipated; pulse small and weak; is pale and anæmic; buccal surface pale; tongue pale and small; stomach dilated; spleen enlarged; left lumbar region dull. Amount of urine passed in twenty-four hours, 4½ ounces; 98 per cent. albumen.

Analysis of Urine by Dr. G. N. Acker.—A few blood corpuscles; renal epithelium; a few leucocytes; numerous large hyaline and epithelial casts; some smaller ones; some amyloid casts; hyaline casts in a granular condition; epithelial casts and renal epithelium undergoing fatty degeneration.

Examination of Blood.—Increased number of white corpuscles. A hot bath was ordered, to be followed by free purgation with compound jalap powder. The tincture of digitalis, in 5-drop doses, every four hours, was commenced on March 24th and continued till April 4th, on which day he passed 16 ounces of urine. On the 27th of March he had a chill, and 8 grains of the sulphate of quinia was given daily for several days, followed by 5-grain doses three times daily of the citrate of iron and quinia, which was continued till April 4th. During the time the digitalis was given, notwithstanding the increase in the quantity of urine secreted daily, the prepuce and scrotum became so swelled with œdematous fluid, it became necessary (March 30th) to puncture with a needle. The fluid poured out freely in large quantity. Four days after the suspension of the digitalis (April 4th) the anasarca began to increase rapidly. The digitalis was resumed, but the œdema progressed. On the 10th of April pulmonary œdema set in; the dyspnœa was very distressing. Free catharsis failing to relieve it, the hot bath was repeated, followed by the extract of jaborandi in 3-grain doses every three hours. The relief was slight, and during the

night of the 14th the dyspnœa was so threatening that the jaborandi was given every hour in the same doses, but failing to produce free diaphoresis, it was suspended, and $\frac{1}{10}$th of a grain of elaterium was given at 6 and repeated at 11 P. M. 15th.

16*th*. Sweated profusely during the night; two liquid stools; $\frac{1}{10}$th grain of elaterium given at 9 A. M.; repeated at 12 M. Sweated by packing bottles filled with hot water about his body under cover.

17*th*. Two copious watery stools during the night; dyspnœa less, but breathing bad. The swelling continued increasing, and the legs and feet were so distended that very many punctures with a needle were made in both calves and on the dorsum of each foot. The discharge was very free and copious. From some punctures it spurted out in jets. Three-grain doses of the extract of jaborandi were given at 6, 7, and 8 P. M., and a dose of the mild chloride of mercury at bedtime.

18*th*. Slept little last night owing to intense pain in neck and throat; oppression more marked; water still escaping from legs; right cheek greatly flushed; sweated profusely; two small stools. During the afternoon the pulmonary œdema increased. Ordered carbonate of ammonia gr. v, every 4 hours, tincture of digitalis gtt. x, every 6 hours, and whiskey ʒij every 3 hours. Erythema spreading over face.

19*th*. Erythema less; slept but little; five profuse watery stools last night.

20*th*. Ten stools since yesterday morning. Extract of jaborandi gr. ix, given during the night.

21*st*. Sweated profusely last night; nine stools; legs again punctured. Given mild chloride of mercury gr. iij.

22*d*. Eight consistent stools; urine increased in quantity.

23*d*. Repeated jaborandi; sweated profusely; urine 9 ounces; albumen 80 per cent. (estimated).

24*th*. Œdema less; stop carbonate of ammonia; urine 20 ounces; albumen 70 per cent.

25*th*. Four stools yesterday; urine 24 ounces; albumen 70 per cent.

26*th*. Tincture of digitalis gtt. v, *ter in die;* urine lost.

27*th*. Six stools; urine 17 ounces; albumen 80 per cent.

℞.—Tinct ferri chlorid. gtt. x.
Ammon. chlorid. gr. v.
Tinct. digitalis, gtt. v.—M.
S.—Three times daily.

℞.—Potass. acetat. gr. x.
Tinct. nucis vomicæ, gtt. x.
Infus. quassiæ, ℥ss.—M.
S.—Once daily.

30*th.* Œdema diminishing; urine 18 ounces; albumen 80 per cent.

May 1*st.* Bowels constipated; $\frac{1}{10}$th grain of elaterium given; four stools; œdema of face very great; urine 18 ounces; albumen 70 per cent.

2*d.* Did not rest very well last night; dyspnœa very great; elaterium $\frac{1}{10}$th grain; urine 15 ounces; albumen 60 per cent.

3*d.* Œdema of eyelids very great; breathing very harassing; had a very restless night. Gave carbonate of ammonia gr. v, every 4 hours; urine 20 ounces; albumen 70 per cent.

4*th.* Œdema about eyelids; coughs very frequently; two stools last night; legs and feet punctured, serum escaped freely. The treatment of the 27th ult. continued; urine 19 ounces; albumen 70 per cent.

7*th.* Three stools last night; urine 19 ounces; albumen 80 per cent.

8*th.* Four stools last night; greatly improved; legs still discharging; urine 20 ounces; albumen 70 per cent.

9*th.* Œdema not so great about face and eyes; tension greatly reduced by the punctures; water still running from legs; abdomen very protuberant; urine 22 ounces; albumen 60 per cent.

10*th.* Is very well; lively; has a good appetite; serum still oozing; urine 25 ounces; albumen 95 per cent.

11*th.* Two watery stools; urine 26 ounces; albumen 33 per cent.

13*th.* Four stools; urine 31 ounces; albumen 50 per cent.

14*th.* Four stools; œdema hardly perceptible about the face; abdomen getting smaller; urine 21 ounces; albumen 35 per cent.

15*th.* Four stools; urine 22 ounces; albumen 35 per cent.

16*th.* Six very watery stools; improving; urine 25½ ounces; albumen 70 per cent.

17*th.* Five very watery stools; is quite lively; runs about the yard two hours every day; appetite good; urine 30 ounces; albumen 60 per cent.

18*th.* Four stools; urine 26 ounces; albumen 50 per cent.

19*th.* Three stools; œdema diminished very much; abdomen and legs still large; urine 30 ounces; albumen 47 per cent.

20th. Four stools; doing well; enjoys himself with the other children in the yard; urine 27 ounces; albumen 45 per cent.

22d. Three watery stools to-day; œdema very much diminished; appetite good; urine 20 ounces.

23d. Vomited after breakfast; four stools; doing well; is out of doors two hours daily; urine $22\frac{1}{2}$ ounces.

24th. Three stools; urine 36 ounces.

25th. Four stools; is comfortable; tongue natural; pulse good; slight œdema below the knees; appetite good; improving in strength; sleeps well; urine 28 ounces.

Analysis of urine, May 30th, 28 ounces; specific gravity 1018; albumen 35 per cent.

Crystals of triple phosphate and urate of ammonium; few casts, mostly of the epithelial variety, long and narrow; some bladder epithelium; different forms of bacteria.

In this case the condition of the kidneys precluded the possibility of cure; nevertheless, the marked improvement exhibited the beneficial effects of good nursing, nutritious diet, and appropriate medication. During the first three weeks of his residence in the hospital, the patient was in constant danger from pulmonary œdema, which at times was so imminent as to threaten immediate death. It was not relieved until after free evacuation of the œdematous fluid by puncturing the integument. At the time the limbs were first punctured he had to be propped up in bed, with his feet hanging over the side. It was not believed at that time to be possible to long defer the final struggle, and the operation was performed simply to relieve the tension and mitigate his suffering.

Preceding the evacuation of the fluid accumulated in the subintegumental tissue, the patient exhibited a marked insusceptibility to the influence of active cathartics, and an equally remarkable tolerance of digitalis and diaphoretics, phenomena not infrequently observed in cases of chronic Bright's disease. This may have been due to some peculiarity of the constitution; but it has seemed to me to depend upon some inexplicable influence of the extravasated fluid in retarding or preventing the action of drugs. Absorption is impeded, probably, by pressure from over-filling of the submucosa of the alimentary tract, as it is when the subcutaneous tissue is distended; whilst also peris-

talsis is diminished by the serous infiltration of the muscular coat.

I have observed many times, in adult cases of Bright's disease, that when the transudation of fluid seemed to have reached its utmost extent, and cathartics, diuretics, and diaphoretics had failed to produce any effect, that unexpectedly there would begin a copious and continuous secretion of urine, rapidly diminishing the tension, and then drugs might be given with the certainty of effect. This has usually, perhaps always, occurred in persons suffering from uræmia, and I have ascribed the spontaneous diuresis to the effect of urea accumulated in great excess in the blood. In this patient there was not at any time any symptoms of uræmic poisoning, and some other explanation must be sought for the phenomenon to which I have referred.

Under the treatment begun on April 27th, the boy has continuously improved; the amount of urine increasing daily, the swelling diminishing, and his strength improving.

Case III.—William W., aged 10 years; mulatto; admitted May 8, 1880. (Notes by Dr. T. F. Mallan, House Physician.)

Had been sick for two months. Was first taken with chills and "pain in stomach." The chills at first were quotidian, later tertian. Afterwards his belly began to swell. Now there is general anasarca, involving the lower extremities and entire trunk; under the chin, obliterating the neck, an enormous œdematous swelling; face much swollen, closing both eyes; the prepuce and scrotum distended. The tongue small, reddened, and coated; pulse 100, intermittent; appetite good; bowels irregular; temperature, 99.6°. Urine small in quantity; 80 per cent. albumen; analysis by Dr. Geo. N. Acker.

A few blood corpuscles and leucocytes. Renal epithelium and hyaline casts. The greater number of hyaline casts were narrow and long, a few broad and short. A large number of waxy casts; not many epithelial casts. Various forms of bacteria; also triple-phosphate crystals.

Ordered 10 grains compound jalap powder, which produced very free catharsis. On the 12th his temperature ran up to 102.8°. Given sulphate of quinine.

May 13. Œdema has greatly subsided under chin. Had three watery stools. Ordered—

℞.—Tinct. ferri chlorid. gtt. x.
Ammon. chlorid. gr. x.
Tinct. digitalis, gtt. v.—M.
S.—Three times daily.

℞.—Potass. acetat. gr. x.
Tinct. nucis vomicis, gtt. x.
Infus. quassiæ, ℥ss.—M.
S.—Once daily.

14*th*. Œdema still great; great tenderness around navel; two stools.

15*th*. Œdema diminishing; urine 8 ounces; albumen 70 per cent.

16*th*. Œdema has subsided greatly. Is comfortable, with the exception of a slight cough. Bowels open twice daily; urine 16 ounces; albumen 60 per cent.

17*th*. Œdema about neck and face disappeared entirely; still remains in abdomen and legs; urine 9 ounces; albumen 60 per cent.

18*th*. Is doing well; œdema still present in legs and abdomen; urine 30 ounces; albumen 60 per cent.

20*th*. Two stools to-day; urine 28 ounces; albumen 60 per cent.

21*st*. Urine 24 ounces.

22*d*. Urine 28 ounces.

23*d*. Urine 33 ounces.

24*th*. Urine 30 ounces.

25*th*. Urine 29 ounces.

Analysis of Urine, May 30*th*. 36 ounces; sp. gr. 1014; albumen, 15 per cent.; a number of crystals of triple phosphate; few hyaline casts, short and narrow; some kidney epithelium.

This case was more unfavorable than the preceding one; the subintegumental transudation involved the entire surface, excepting the hairy scalp. Under the chin, and projecting beyond it, was an enormous œdematous swelling, extending downward to the manubrium sterni. So great was the effusion under the skin covering the abdomen, that it was impossible to determine the presence of fluid in the peritoneal cavity.

In this case the action of medicines was more prompt and relief sooner obtained. A single dose of 10 grains of the compound jalap powder produced very free catharsis. Having observed the rapid amelioration of the symptoms in Case II.,

following the administration of the combination of iron, digitalis, and chloride of ammonium, and a daily dose of the acetate of potassium and tincture of nux vomica in the infusion of quassia, this patient was put upon the same treatment on the fifth day after his admission into the hospital, with the same happy effect. It combined the elements of increasing heart power, improving the quality of the blood, diuresis, and invigorating the appetite and digestion, thus fulfilling the paramount indications in the management of these cases.

In these cases of chronic Bright's disease, life is usually terminated by one of three complications, uræmia, pulmonary œdema, or cardiac insufficiency. Unless destroyed by uræmic poisoning, the patients usually survive as long as heart power can be maintained, for the œdema of the lungs is generally an expression of heart feebleness. Heart power must be maintained by improvement of the blood and tonics. Nutritious and easily digested food and chalybeates, constitute an essential part of the treatment. The choice of ferruginous preparations is of great importance. I have usually preferred the citrate of iron and quinine, because of its special value in the treatment of chronic malarial poisoning; but the tincture of the chloride will often be found preferable, because of its certainty, and availability in combination with other medicines. Previous to the administration of iron, in any form, it will frequently be necessary to employ, or use in connection with it, some stomachic or digestive tonic. The tincture of nux vomica or strychnia has usually been sufficient. The combination of the acetate of potassium and tincture of nux vomica, in the infusion of quassia—previously referred to, and suggested by Dr. Beverly Robinson—has proven exceedingly valuable as an invigorator of the appetite and digestion. As a pure heart tonic, there is no drug of equal value and certainty of good effect as digitalis. I accept fully and completely the recent views in regard to the physiological action of digitalis, and as positively reject the older teaching of its depressant influence upon heart power. Unfortunately, the theory of its action, until recently very generally taught, and the fear of cumulative power, which I have never witnessed, has deterred many practitioners from its continuous use for a sufficient period to secure and maintain any marked increase of the power of the heart, and tension of the arteries. Failure has been frequently ascribed to its depressing influence,

when, in fact, it was due to the absence of any effect, because of its employment in insufficient quantity for a very brief period. By reference to the clinical notes, it will be seen that, in Case II., the tincture of digitalis was given in five-drop doses every four hours, for ten consecutive days, to a boy ten years of age; and, subsequently continued in the same doses three times a day, for five successive weeks; and in Case III., it has been given continuously during several weeks. In neither case has any toxic action been observed. So long as the heart's beats are above, and the tension of the arteries below a normal standard, and the daily discharge of urine is about the quantity in health, or increasing, digitalis may be continued. Its toxic power will usually be exhibited, either by very rapid slowing of the pulse, or sudden diminution in the quantity of urine, associated with high arterial tension. I have used it in substance, infusion, and tincture, and prefer the last form, except when I wish to avoid the disagreeable taste; then substituting the granules of digitalin.

All observers agree in regard to the value of catharsis, diuresis, and diaphoresis, as methods of evacuating the fluid accumulations; but there is great contrariety of opinion as to the efficiency of the members of the several classes of therapeutic agents, and their admissibility in special cases. Active catharsis, when easily induced, and free from exhaustion, often affords speedy, but partial relief. As a rule, it cannot be continued long enough, without danger of greatly increasing the debility, or causing irritation of the alimentary tract. The bitartrate of potassium and the tartarus boraxatus are favorite remedies with many, and very efficient; the compound jalap powder is a safe, though not a very certain cathartic, except in large doses, and is then apt to occasion tenesmus. Elaterium, in doses from one-twelfth to one-eighth of a grain is very prompt, but is admissible in comparatively few cases, both because of its nauseating quality, and the danger of collapse. In cases of uræmic poisoning, when the stomach will tolerate it, its energetic action as a hydragogue cathartic, gives it the preference. Whether it possesses the power of eliminating urea through the intestinal mucous membrane is a disputed question. I have several times witnessed the rapid disappearance of large collections of fluid in the peritoneal cavity by the continuous use of this drug.

Eberlé's formula[1] (omitting the tartar emetic), has proven the most certain and satisfactory cathartic that I have employed in dropsies.

Diuretics are divided into two classes; one, like digitalis and squill, increasing the power of the heart and arterial tension, the other acting upon the kidneys. Fothergill styles digitalis a hydragogue diuretic, because, by increasing blood-pressure, it augments the transudation of the water through the kidneys, without increasing the quantity of solid constituents of the urine; whereas, those which act directly upon the excretory function of the kidneys, augment the elimination of solids. In those cases of chronic kidney disease, complicated with cardiac insufficiency, the continuous use of digitalis is demanded. It may frequently be combined, with great advantage, with some of the second class; with the acetate of potassium, when lithiasis is present, or with nitre, juniper, or buchu, when it is desirable to increase the excretion of the solids. Experimenters insist that digitalis has no diuretic action when given to a healthy person. In the absence of cardiac insufficiency it is useless, and sometimes detrimental. Excepting digitalis, when properly employed, diuretics are very unsatisfactory remedies. Sometimes the sweet spirits of nitre, like others of the same class, will produce an extraordinary flow of urine; and, again, when given under circumstances apparently precisely similar, it will prove utterly valueless. The class of drugs which are supposed to excite the secreting cells of the kidneys like buchu; and those which are believed to act upon the kidney circulation, independently of any effect upon the general circulation, are unreliable diuretics. I know of no one, or combination of such drugs, which can be given with a certainty of increasing the flow of urine. Some fruits produce in some persons very copious diuresis; peaches in a few, and grapes in very many, will prove valuable aids in promoting the flow of urine.

In cases of great emergency diaphoresis is the preferable method of affording relief, because more certainly, easily, and efficiently produced than either catharsis or diuresis. The hot-air bath, as I have previously described it, is more effective than a hot-water bath, and more speedy and certain than jaborandi. This drug, either in substance, infusion, fluid or solid extract (the

[1] ℞.—P. cream of tartar, ℥jss; P. sulphat. potassæ, ℥ss; P. scillæmaritim. ʒij; Tart. antimonii, gr. ij.—M. S.—One teaspoonful four or five times daily. (Eberlé; Treatise on Practice of Medicine, vol. ii. p. 446, 1831.)

latter preparation I prefer), rarely fails, when given in sufficient quantity, to produce profuse sweating; but it is not entirely free from danger in cases of advanced heart degeneration. In uræmic intoxication or coma the bath is always admissible, and may be assisted by the hypodermic use of pilocarpin. The effect of jaborandi is more durable than the bath, and when necessary to prolong the sweating it will be judicious to follow the bath with jaborandi, and when prudent to renew the diaphoresis daily or oftener, it is best to alternate the two remedies. After a free diaphoresis, a moderate sweating may be continuously kept up, as may be desirable, by the use of jaborandi in proper doses at shorter or longer intervals. I have many times employed the oil of juniper by inhalation in connection with diaphoretic and cathartic remedies, but am doubtful of its value.

In the treatment of these conditions it is never wise to rely exclusively upon evacuation either by the alimentary tract, kidneys, or skin. In most cases all may be advantageously employed, and a judicious combination of resources will yield the best results; but whatever method may be preferred, the treatment should not be suspended or abandoned until the daily secretion of urine is equal in quantity to or greater than the discharge in health.

The propriety of the evacuation of œdematous fluid by incision, scarification, or puncture of the skin, must be left to the judgment of the practitioner. Sometimes it is necessary to avoid rupture, and in other cases it will afford very speedy relief. In old subjects, when the skin is of low vitality, there is danger of cellulitis or sloughing. Incision ought never be practised; scarification is less objectionable; but puncturing with a round instrument or needle may be done, especially in young subjects, with great benefit. When the skin is pale or semi-transparent but little blood will be lost, and when the punctures are quickly made but little pain attends the operation. If sufficiently numerous about the calves and back of the feet, the discharge will be copious and continue sometimes for several days. The rapidity of the loss of fluid will depend upon the degree of tension. After healing, the punctures or points of exit will be marked by redness, which may remain for a long time. A recent writer has suggested the insertion of suitably constructed canulæ in the integument, so as to provide apertures of exit for fluids, as it may escape into the subcutaneous tissue and thus prevent accumulation.

A CASE OF CONGENITAL OCCLUSION AND DILATATION OF THE LYMPH CHANNELS.

By JAMES S. GREEN, M.D.,
NEW JERSEY.

April 26, 1880, I was called by Dr. J. S. Crane, of Elizabeth, to see a newly-born child of eight months' utero-gestation with a large fluctuating tumor situated upon the posterior part of the pelvis, a little to the right of the median line, and having a broad base; it was slightly irregular on the surface, semi-transparent, and measured as follows: circumference of its base, 10¼ inches; long diameter, 7 inches; transverse diameter, 5¾ inches.

In the abdominal region, in front and at the right side, were two other cysts, which had no communication with each other or with the posterior tumor. They extended from the lower edge of the ribs to the crest of the ilium, and had the same characteristics as the posterior one, and were superimposed one upon the other. The upper tumor had a long diameter of 2½ inches and a transverse diameter of 2 inches, the lower one a circumference of the base of 9½ inches, a long diameter of 4½ inches, and a transverse diameter of 4 inches.

Pressure upon the posterior tumor producing no inconvenience to the child, no convulsive motion or fulness of the anterior fontanelle, and as it seemed to Dr. Crane and myself that the sac would soon rupture, it was determined to aspirate the posterior tumor, which I did on April 28th, and removed the entire contents, which consisted of a clear, straw-colored fluid of a specific gravity 1007, slightly salt to the taste, and containing (as shown by boiling it) one-eighth of albumen. Under the microscope, nothing was discoverable but a few red-blood corpuscles. The amount of the fluid removed at this time was 120 grams. The child gave no evidence of discomfort during the aspiration or after it.

In passing I would say that the child is as healthy, and to all appearances as well as any child of its age; its secretions, digestion, circulation, and sleep being excellent.

In ten days after the emptying of the sac it had filled again

to its former size, and, being in doubt as to its true nature and proper treatment, I invited Dr. A. Jacobi, of New York, to see the case, which he did on the 12th of May. He pronounced it a case of lymphangiectasis, and recommended the removal by aspiration of a small quantity of the fluid and an injection of a like amount of the tincture of iodine into the sac, which was done the following day. The injection gave the child some uneasiness, which passed away in two hours.

On May 25th and May 29th I repeated the operation and injection, removing at each succeeding aspiration more fluid and injecting more tincture of iodine.

The posterior tumor, to which our efforts have been solely directed, measures at the present time as follows: in circumference of base, $9\frac{1}{2}$ inches; in its long diameter, $6\frac{3}{4}$ inches; and in its transverse diameter, $5\frac{1}{2}$ inches. Comparing these measurements with those first taken, it will be observed that the posterior tumor has diminished in size under the use of the tincture of iodine.

The tumors in front, however, upon which no treatment has been tried have increased, and a small one has been developed upon the left hip opposite the acetabulum.

Note.—On the 6th of June I endeavored to aspirate the lower abdominal tumor, but could obtain no fluid, although a drop of clear fluid, like lymph, appeared at the point of puncture after the withdrawal of the needle.

The posterior tumor has diminished in size in a marked degree, measuring in its circumference of its base $8\frac{1}{2}$ inches; in its long diameter, $5\frac{3}{4}$ inches; and in its transverse diameter, 5 inches. The sac is thickened and has lost its transparency.

June 30. I again attempted to aspirate the abdominal tumors without obtaining any fluid, except a drop of clear lymph, at the withdrawal of each needle, neither was there the discharge of any gas. When the needle was plunged into the tumor, it gave to the finger the sensation as if it had passed into a bladder filled with air, and a crackling sound was distinctly heard.

The posterior tumor had become still smaller. Sixty grams of clear lymph was withdrawn by the aspirator, and one gram of Churchill's tincture of iodine was injected. This injection gave the child so much inconvenience, that it was necessary to administer an anodyne, but on the following day all uneasiness had passed away.

ATROPHY OF A FŒTAL LIVER.

By A. JACOBI, M.D.,

NEW YORK.

The specimen I have the honor to present, I owe to the kindness of Dr. Hans Kudlich, of Hoboken, N. J., who accompanied it with a history the main points of which are the following: Mrs. K., 22 years old, slender but healthy, married one year, primipara, menstruated about the end of July, 1879, and expected her confinement about May 7th. Her husband is 30 years old, fair, short, and robust; suffered several times from gonorrhœa and stricture, for the last time one and a half years before his marriage. There is no history, nor are there symptoms of syphilis. The pregnancy took a normal course; but little movement was felt since the seventh month. On April 26th, 1880, slight (labor) pains set in, in back and uterine regions. They disappeared after having lasted six hours. After that no movements of the child were perceived; no heart-beat could be heard. There was no chill. Strong and effective labor-pains set in on May 11th, 11 P. M. As the membranes ruptured early, the occiput could be felt presenting; the sutures widely patent and inelastic. At 3 A. M. on May 12th the large head was born; the shoulders took some time to come; still longer was the abdomen retarded in coming down, and when finally extracted it was found to be very large. The child was dead; the epidermis peeled everywhere. The length of the child was normal; its weight ten pounds. The abdominal cavity contained four pints of a thin, purulent, bloody liquid. The liver was not seen when the abdomen was opened, but finally found high up under the posterior portion of the diaphragm; it weighed one ounce. The other organs were normal, with the exception of the brain, which was œdematous and contained a thin reddish fluid in the ventricles.

This liver weighs thirty grammes; the child weighed about

5000 grammes, the contents of the abdominal cavity included. When the abdomen was emptied of its liquid contents the child still weighed about 3000 grammes. Thus the weight of this liver is one per cent. of the total weight of the body. Granted that Delafield's estimation that the liver of the newly born is $\frac{1}{24}$th of the weight of the body is correct—for what I have seen and weighed convinces me that the weight of the liver is underrated by him—this one is at all events only one-fourth of what it ought to be in weight. Its surface is quite smooth. The fœtal lobulation appears to be rather normal, the grooving shows a normal relation to the body of the liver, its reduced size taken into account. The peritoneal covering appears normal, with the exception of its lower part. In the neighborhood of the gall-ducts and portal and umbilical veins the peritoneum is quite thick, of five or six times its normal thickness, compressing the lumina to a great extent. White layers of fibrous tissue extend from here into the substance of the liver in every direction, and are found on every section. With the exception of this, the general appearance of the tissue is very uniform indeed, the whole mass, with the exception of bloodvessels and biliary ducts, being made up of connective tissue. No such change had taken place in any other organ. The normal condition of all of the organs was plainly apparent; not even the spleen was found enlarged, which after birth is always expected to be found enlarged when the liver is considerably contracted. The explanation of this fact is probably to be sought for in the circumstance that the compression of bloodvessels in the liver of the fœtus need not result in either swelling of the spleen or hyperæmia of the branches of the portal vein; for in case of impermeability of the liver to the blood circulation, it is not the spleen and portal vein territory which compensate, but the umbilical vein and placenta.

What is this liver if not a genuine case of congenital atrophy? and what does it result from except from frequent and extensive perihepatitis in fœtal life? At all events I am at a loss to explain this specimen, the like of which I have not seen. To say that I can explain the origin of fœtal peritonitis leading to such a serious result would be presumption itself. But what we do know for certain is the fact that fœtal inflammations are by no means rare. Peritonitis more general than this before you, which appears to have spent all its force in a perihepatitis (the exuda-

tion into the abdominal cavity), result from the interruption of hepatic circulation, and not from universal peritonitis, are not infrequent, and the inflammations in the fœtal heart and large bloodvessels are so often found as to require no mention. It is not necessary to assume this case to be a case of cirrhosis; the specimen is rather one of genuine atrophy than of cirrhosis, and the latter process has, though it has been found in early childhood, not been seen in the fœtus.

If there was any suspicion of syphilis in the history of the case, syphilis might be accused of being the cause of this contraction. But the large number of cases of syphilitic liver we meet with in the young—when in the diffuse variety—are those of considerable enlargement, which if lasting long enough, may lead to final contraction in the born child. But even then, lobulation is more irregular, complete, and radiated. After all, then, I claim this case as one of atrophy, particularly of the glandular substance of the liver, produced by exudative perihepatitis—a case so unique in my experience that I did not wish to forego the pleasure of presenting it to this Section.

CASE OF SUPRA-PUBIC LITHOTOMY.

By A. JACOBI, M.D.,

NEW YORK.

TIMOTHY CORNELL, six years, United States, was admitted to the Children's Ward of Mount Sinai Hospital (No. 16,567) on April 28, 1880. The boy had measles two years ago. With this exception he has always had pretty good health, although he at times during the past four years has evinced trouble in passing his water, such as pain and sudden interruption of the stream, when he would run about the room crying until the passage was clear again. Nine months ago a small amount of blood was passed with the urine. Urine has been of a high color, and contains a considerable urate sediment. Passes water six or seven times during the day, and always more than once during the night.

On admission the child was rather thin, somewhat anæmic, face rather drawn, suggestive of pain and greater age. Appetite good; bowels regular; temperature, pulse, and respiration normal.

May 5th, 4 o'clock P. M. Operation of epicystotomy performed. Boy chloroformed. Bladder well distended with lukewarm water to the extent of 200 to 220 grammes. Abdomen washed with a three per cent. solution of carbolic acid. A linear incision of two inches nearly midway between the umbilicus and superior border of the penis. The distended vesical wall was readily reached; picked up with a hook and small incision; snipped with scissors; several ounces of water escaped from the bladder; retractors were introduced, and the vesical opening enlarged to permit the entrance of stone forceps, with which the stone was at once grasped and withdrawn. The wound was touched gently with a five per cent. solution of zinc chloride. After operation ordered tr. opii gtt. v every two hours, and spts. frumenti 4.0 every two hours. Temperature 8 P. M. 99.2°; 10 P.M. 100.6°.

6th. Temperature 1 A. M. 101; 5 A. M. 101.5; 8 A. M. 103.5; 12 M. 103.2; 5 P. M. 102.4; 9 P. M. 102; 12 P. M. 101.2. Child slept well after the operation. This morning pulse 140, wiry and jerky. Respiration 30. Abdomen tympanitic, tender to touch. Urine constantly dribbling from the wound. Tongue coated, moist. Ordered tr. opii gtt. vj each hour. Ice cold cloths applied to abdomen every ten minutes, day and night, with carbolized sponge over the wound to absorb urine, also repeatedly changed.

7th. Temperature 3 A. M. 101.3; 9 A. M. 102.5; 2 P. M. 101.5; 5 P. M. 100.9; 12 P. M. 100.2. This morning the patient has passed about four ounces of bloody urine per urethram; very little dribbling through the wound. Boy passed a moderately good night. Pulse 150; respiration 30. Continued treatment.

12 o'clock M. Bladder washed out with 0.5 per cent. solution of carbolic acid warm; water escaping both by wound and through the catheter.

2 P. M. Pulse 138; respiration 30. Boy says he feels pretty well, suffers no pain when undisturbed.

5 P. M. Pulse 132; respiration 30. This afternoon boy complains of pain in abdomen, which is more distended.

8th. Temperature 4 A. M. 99.4; 8 A. M. 100.5; 4 P. M. 101; 8 P. M. 100.1; 12 M. 99.8. Last night boy slept well, but complained of pain each time he awoke. Ordered tr. opii gtt. x each hour. This did not relieve pain. Ordered dose to be increased to gtt. xv each hour for two hours; if borne well, and yet failed to relieve pain, dose to be increased to gtt. xx each hour. Then the child slept more steadiy, but vomited medicine several times. Ordered small pieces of ice after medicine. Ice-cold cloth applications still continued every ten minutes day and night.

9 A. M. Boy sleeping quietly. Bladder washed out after a small quantity of urine was drawn.

4 P. M. Urine drawn by catheter perfectly clear. Pulse 130; respiration 30. Continue tr. opii gtt. xx each hour, and spts. frumenti 4.0 each hour.

8 P. M. No change; has passed 3 ounces through the penis.

12 o'clock P. M. Pulse 112; respiration 24. Pupils moderately contracted. Patient has been sleeping.

9th. Temperature 4 A. M. 99.8; 8 A. M. 99; 1 P. M. 101.2; 4 P. M. 101.4; 8 P. M. 101.8; 12 P. M. 101.

8 A.M. Respiration 26; pulse 126, good. Pupils moderately contracted. Did not vomit at all during the night.

1 P.M. Slightly diminished tenderness of abdomen. Veins on abdomen very prominent. Patient has passed about two ounces of urine through urethra. Four ounces more were drawn by catheter. Sleeps a good deal; wound looking nicely.

4 P.M. Pulse 125; respiration 24. Urine still dribbles in drops from the wound. Tr. opii now given gtt. xv each hour. Tongue coated, but moist. Vomiting was relieved by teaspoonful doses of ice-cream given after the medicine.

5 P.M. Bowels have moved once. Evacuation was of a thin, yellowish character; child very quiet, but complains only of dryness of the mouth. Drew off about six ounces of clear urine. Ordered opium to be suspended for two hours on account of drowsiness.

8 P.M. Pulse 135; respiration 24. Ordered return to tr. opii. 11 P.M; pulse 130; respiration 21.

10*th*. Temperature 4 A.M. 101; 8 A.M. 100.9; 1 P.M. 101.2; 5 P.M. 102.3; 8 P.M. 102.8, 12 P.M. 103.8. Child rested quietly during night, but had two stools diarrhœal in character. This morning tongue thickly coated. Pulse 133; respiration 30. Abdomen less sensitive to touch, still distended, and superficial veins yet prominent. Slight infiltration about the wound. No vomiting during the night or this morning; five ounces of urine drawn off. Urine contains several small pieces and flakes. Has been taking gtt. xv tr. opii every hour.

3 o'clock P.M. Respiration 36; coarse mucous râles heard over anterior thoracic wall; slight dulness at the right apex. Ordered tr. digitalis gtt. j each hour; continue gtt. xv tr. opii each hour.

11*th*. Temperature 4 A.M. 102.4; 8 A.M. 102; 12 M. 101.4; 1 P.M. 100.8; 8 P.M. 100.8; 12 P.M. 100.8; pulse 130, strong. Drew about six ounces of urine, containing white tissue flakes in otherwise clear urine; abdomen less tender; bowels moved once; child is coughing a little; tongue coated.

P.M. Drew off about two ounces of urine. Ordered quinine sulph. 0.20 each hour. Later, vomited two doses. Pulse 120; respiration 20. Ordered tr. opii gtt. xv each hour; tr. digitalis gtt. j each hour.

12*th*. Temperature 4 A.M. 99.8; 8 A.M. 100.4; 11 P.M. 101.2; one stool during the night; passed urine himself in bed;

about $1\frac{1}{2}$ ounces of urine drawn by catheter at 10.30 A. M. Pulse 1.30; respiration 30. Vomited opium and quinine. Abdomen much less sensitive and tympanitic. Tongue still thickly coated; breath bad; mucous râles in chest less loud; cough looser and less. Increase tr. opii to gtt. xx each hour.

2 o'clock P. M. Pulse 108; respiration 40. 10.15 P. M. Attempting to pass catheter, found, on introducing finger in rectum, a large impaction of semi-solid feces, which prevented catheter from entering the bladder. Gave a series of small, warm injections, when, after considerable straining and digging with the finger, feces in large quantity were detached and passed. After passage of first large piece, boy made water freely through penis. Pulse 126; repiration 28.

13*th*. Temperature 4 A M. 100.2; 8 A. M. 100.8; 1 P. M. 100.1; 5 P. M. 100.8; 8 P. M. 100. Patient slept well during the night. Passed about two ounces of urine, which contained amorphous granular urates, urates of soda, and mucus in quantity; also considerable vesical epithelium and number of pus-corpuscles.

12 o'clock M. Pulse 120, irregular; respiration 20. Abdomen only slightly distended, and but slight tenderness, except about vesical region; boy moves about in bed without pain.

10 o'clock P. M. Pulse 120; respiration 38.

14*th*. Temperature 8 A. M. 100.5; 4 P. M. 100.6. Vomited once; has had a stool. Boy evidently improving.

15*th*. Temperature 3 A. M. 99.2; 8 A. M. 98.9; 2 P. M. 99.5. Vomited twice to-day after medicine; no pain. Less tympanites; sleeps a great deal. This morning drew off about two ounces of urine, and washed out the bladder with a very weak solution of carbolic acid. Tongue still thickly coated. Pulse 120, rather weak; respiration 30. Urine still dribbling from wound. When boy cries, urine wells up in quantity from the wound. Had two stools, thin and yellowish in character. Discontinued tr. opii. Ordered bismuth subnit. 0.30, three times a day. Temperature 5 P. M. 99.8; 9 P. M. 100.

16*th*. Temperature 2 A. M. 98.5; 7 A. M. 98.8; 1 P. M. 99.6; 5 P. M. 99.7. This morning, pulse 130, fair. On introduction of catheter very little urine came through it. On washing out the bladder the water flowed freely from the wound, carrying with it a thick deposit of phosphates of ammoniacal odor. Boy is still troubled with slight diarrhea and gastric irritability.

Ordered barley water with milk and creta and bismuth subnit. Patient has vomited three times to-day, and has had three stools in the last twenty-four hours. Is taking spts. frumenti 4.0 each half hour.

17th. Temperature 5 A. M. 98.9; 8 A. M. 99; 5 P. M. 99.2; 9 P. M. 99. Diarrheal discharges have ceased; has had one fair stool; child looking better; cough has ceased.

18th. Temperature 3 A. M. 99.1; 8 A. M. 99.2; 1 P. M. 99.6; 5 P. M. 99.8; 12 P. M. 99.2. This morning wound is looking healthier; beginning granulations, of good color. Urine, on being drawn, showed less sediment than heretofore. Pulse 132, good.

19th. Temperature 8 A. M. 98.9; 2 P. M. 100.8; 5 P. M. 99.8; 12 P. M. 99.4. About three ounces of urine drawn from bladder, containing numerous flakes. Tongue less coated; wound looking well. Vomited once during the night. Has had two semi-solid stools. Pulse 120; respiration 20.

P. M. Has vomited once to-day. Bowels have moved once. Child has a good appetite; wants more to eat. No pain in abdomen, except in small circuit about the bladder.

20th. Temperature 8 A. M. 99; 2 P. M. 100.8; 5 P. M. 99.9. Passed a large piece of white tissue material of densely clotted mucus through wound with urine this morning. When the catheter is passed, child cries and strains, causing quite a flow of urine, thickly mixed with mucus, pus, and vesical epithelium, from wound. The sponge kept over the wound is constantly changed, but always has a greater or less quantity of this thick material adherent. Child had one stool last night; he has not vomited.

21st. Temperature 8 A.M. 99; 2 P.M. 99.6; 5 P.M. 99.5. Had one good stool this morning. Child is improving.

22d. Temperature 1 A. M. 99.6; 8 A. M. 99.2; 1 P. M. 99.9; 5 P. M. 100. Wound granulating nicely. Boy has passed no water through urethra except by catheter for over a week. Boy's condition improving daily. Appetite excellent; eats raw meat and toast. Urine is, as always, alkaline. Pulse 100; respiration 30.

23d. Temperature 7 A. M. 100.9; 4 P. M. 99.9.

24th. Temperature 8 A. M. 99.2; 1 P. M. 100.2; 5 P. M. 100.5. Pulse this A. M. 118, good. The discharge of thick pus from the wound is still more copious when the boy strains his abdo-

minal muscles, as he does when the catheter is passed, and while it is in the bladder. During and after catherizations the boy evidently suffers considerable pain.

P. M. Has had a good stool this afternoon.

25th. Temperature 7 A. M. 99.9; 1 P. M. 100.1; 5 P. M. 100.4. This morning the boy has slightly flushed face, but eats and sleeps well. On washing out the bladder a thick tenacious mass of pus and ropy mucus came both through the wound and through the catheter. Boy cries lustily all the time the catheter is in the bladder, and for awhile after its removal.

26th. Temperature 7 A. M. 99.1; 1 P. M. 99.5; 5 P. M. 99.5. Catheter entered the bladder with more ease than usual. Discharges through the catheter more copious than usual, giving a little more than one ounce of thick creamish-white urine of alkaline reaction, and, on microscopic examination, showing *only* healthy pus-corpuscles in great profusion. Less urine and discharge came from the wound. Surface of wound is granulating nicely, especially around the periphery. The fistula in the centre of the wound connecting with the bladder is evidently very small, so as to admit but drop discharges, or on straining but a very small slow stream. Boy looking well; suffers pain during and after catherization.

27th. Temperature 8 A. M. 99.5; 1 P. M. 99.9; 5 P. M. 100. Granulations in the centre of the wound somewhat pale. Boy has again passed a little water voluntarily through the urethra. Has had a good stool this A. M.; tongue clean. Pulse strong and regular, 96.

28th. Temperature 8 A. M. 99.2; 1 P. M. 99.9; 7 P. M. 99.8. This afternoon the boy was chloroformed, and a silver catheter passed per urethram. No discharges through the catheter until carbolic acid water had been thrown in, when it came most freely from the abdominal wound. Catheter afterwards introduced into the bladder through the wound. Bladder well filled with water. Catheter removed, and evacuation of bladder assisted by pressure over the right inguinal and iliac region. Corresponding pressure over the left side had no effect in squeezing water from bladder through the wound. This circumstance suggested the idea of displacement and adhesion of the bladder to the right of the median line or original malformation. Sol. argent. nit. ($\frac{1}{2}$ per cent) was thrown into the bladder.

29th. Temperature 9 A. M. 99; 1 P. M. 99.2. This A. M. the

catheter was introduced through the wound, when a more copious discharge of very opaque urine occurred. Examined microscopically after twelve hours it contained a great quantity of pus corpuscles, a number of triple phosphate crystals (which have probably formed since the urine was drawn), and ropy mucus.

Since this daily record here read, I shall add the history of the case during the last five days in a very few words. Twice daily have warm carbolic water ($\frac{1}{2}$ per cent.) injections been made into the bladder, once daily an injection of either $\frac{1}{5}$ or $\frac{1}{2}$ per cent. solution of silver nitrate. This discharge of pus is becoming less, the condition of the child is improving daily, the wound looks healthier, the granulations are of normal appearance. In future an injection of nitrate of silver will be made but once in two days. The probability is, that the child will get over his disease, his operation, his peritonitis, and his cystitis.[1]

In connection with this case, I propose for discussion the following questions: How old was the stone?—which consists of a uric acid nucleus and consecutive layers of phosphates, with the shape and size of an almond. Was it congenital? or formed in the first period of infancy? or at the time when the first symptoms were noticed a year ago? Probably not the latter, for it must be assumed that, unless there is another cause for irritative symptoms in the condition of the bladder, the stone cannot act as an irritant except when arrived at a certain size. Besides, the cases in which stones are found in either kidneys or bladder, without having given rise to serious symptoms, in post-mortem examinations, speak for the possibility of this stone having been in the bladder a long time. At some other occasion I have spoken of the result of forty post-mortem examinations, in very young children, where it so happened that in six renal calculi were met with. How old this stone may have been, it is difficult to say. It looks to me as if it did not date from earliest infancy, for the bladder was not very much contracted, nor very much thickened, when examined during the operation.

[1] Within a fortnight after the meeting in which this case was detailed, the urine became gradually clearer, pus diminished, wound contracted, patient urinated through the urethra in normal intervals, and not at all during the night, and was cured.

What was the cause of peritonitis, which came near proving fatal? Certainly there was no injury to the peritoneum, though such occurrences have taken place. It appears to me that there can be but one explanation, the more so, as the inflammation set in within half a day after the removal of the stone. I have stated, in regard to the size of the bladder, that it was not very much contracted. But still, a certain force was required to inject about two hundred grammes of water, for the purpose of raising the bladder out of the pelvic cavity. In consequence thereof, there must have been a stretching of the peritoneal covering of the bladder, sufficient to produce irritation and inflammation. Now, as these injections into the bladder must be large enough for the purposes of the operation, *is not this very danger a contraindication to the supra-pubic operation altogether?*

How large may the doses of quinine be which are given to a boy of six years? He took fifteen and twenty drops of laudanum every hour, before, after four days, some drowsiness made its appearance. Individual resistance differs so much, and peritonitis bears so much, that the doses of opium must be selected, not according to a schedule, but to necessity or the accomplished effect. I began with giving five drops, and had to increase the dose to twenty, in a very short time, and should have continued, if it had proved necessary. To what extent opium is tolerated, particularly in peritonitis, has been proved to me by a case which I may detail in full at some other place and time, where a Bellevue Hospital patient of mine, a woman, was given 100 grammes of sulphate of morphia (1500 grains) in the course of twenty-five days, of which on *one* day nearly six grammes (90 grains) were given *hypodermically*. She never suffered from the morphia, and recovered from her peritonitis.

What was the condition of the bladder during the slow recovery of the patient? Soon after the operation he passed urine through the urethra, and after a little while stopped doing so. When, at the later period, the catheter was introduced, he complained of pain about the neck of the bladder. In the beginning, the urine was clear; after the 9th of May, it became mucous, flaky, purulent; and later, large quantities of pus were discharged, amounting to several ounces daily. This pus came mainly on pressure over the left half of the bladder. It gradually diminished in quantity upon injections of carbolic acid water and nitrate of silver solutions. What was the actual

pathological condition? An abscess, certainly, but where? Was it an abscess in the wall of the bladder? In the wall of the uterus abscesses have been described, and I have seen them. In the wall of the stomach they have been described but lately, by several observers, as *gastritis phlegmonosa.* Fortunately, no post-mortem examination revealed the actual condition of things to the naked eye, but it appears to me that the early appearance, large quantity, and persistent discharge of pus points to a *cystitis phlegmonosa*, the location of which was so near the mucous membrane that the latter was readily perforated, and the ulcerated surface could be brought just as readily under the influence of the carbolic acid wash, and the solution of nitrate of silver. The latter was but very weak; I usually employed from one-third to one-half per cent. solutions, and unless cauterization is to be accomplished, I advise against stronger solutions, either in bladder, or nares, or pharynx.

MINUTES OF THE SECTION

ON

SURGERY AND ANATOMY.

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ON

SURGERY AND ANATOMY.

TUESDAY, June 1, 1880.

Dr. W. T. BRIGGS, of Tennessee, Chairman; Dr. C. POWELL ADAMS, of Minnesota, Secretary.

Dr. BENJAMIN LEE, of Pennsylvania, read a paper on *Spinal Extension*, illustrated by numerous diagrams, etc. He showed his apparatus for self-suspension.

Dr. GEO. M. BEARD, of New York, read a paper on *Phimosis as a Cause of Nervous Symptoms, with Results of Operations*, and gave the results of operative treatment in several of his cases.

Dr. C. HART, of New Jersey, related other cases, in which an undoubted connection existed between redundant prepuce and various nervous symptoms. Circumcision was not always necessary. Simple splitting of the prepuce might often suffice.

Dr. G. T. MAXWELL, of Delaware, remarked on a case which had occurred in his practice: A boy, five years old, who made slow recoveries after attacks of diphtheria and pneumonia. Upon examination, orificial contraction was ascertained to be present. The urine also contained saccharine matter. Circumcision was performed, and resulted in an entire removal of nervous symptoms. Anti-diabetic treatment had formerly lessened the amount of sugar in the urine, but after the operation, diabetic urine was never passed.

Dr. LEE, of Pennsylvania, referred to the probable connection between the disorders of ovulation and the establishment of lateral curvature of the spine in young females. He remembered cases of hip disease where redundant prepuce had existed, but he had had no idea of any interrelation between the two.

Dr. S. J. HERRICK, of Ohio, mentioned a case and alluded to disturbances resembling those described by Dr. BEARD; but this case was not amenable to treatment by circumcision.

Dr. A. HARD, of Illinois, had advised the operation of circumcision in cases of mental alienation. This was done merely to make an impression on the patient, and had been practised where preputial redundance did not exist.

Dr. JOHN T. HODGEN, of Missouri, read a paper on *Section of the Infra-Orbital and Inferior Dental Nerve for Neuralgia.*

Dr. J. R. WOOD, of New York, thought the first operation was not a difficult one with the right appliances and plenty of light. His own method of operation differed somewhat from that adopted by Dr. HODGEN. A disk of bone was removed from the anterior wall of the antrum; another disk was then removed by a smaller trephine; the spheno-maxillary fossa and foramen rotundum were reached, and by curved scissors, the nerve was cut where it made its exit from the foramen. Meckel's ganglion, he added, should be removed if success was expected to be permanent. But in the majority of cases, although all the nerve was removed, the terrible malady would return. Relief often followed immediately after operation, but this did not permanently continue. Concerning operations on the jaw, he had repeatedly trephined, and the patients had generally been quite cured. Still the pains might come back. On the other hand, the pains were so excruciating that any operation was warranted.

Dr. W. H. PANCOAST, of Pennsylvania, said that the portion of nerve removed might include only its diseased portion, and thus lead to a cure. Dr. PANCOAST's father was said to have removed a part of the nerve, even beyond the foramen ovale, in four successful cases.

Dr. HART, of Pennsylvania, related a case where Meckel's ganglion had not been removed and cure had taken place.

Dr. H. F. CAMPBELL, of Georgia, thought that, in cases reported as such, Meckel's ganglion had not always been removed. He believed in the central origin of this affection. Hence, removal of peripheral nerve-portions could not be expected to result in a cure.

Dr. CHAS. F. STILLMAN, of New Jersey, showed a brace, devised by himself, for weak ankles.

Dr. HINGSTON, of Montreal, said an early tenotomy was always the best remedy. He would, however, not operate if the foot could be easily brought into proper position; and it was in such cases that mechanical appliances should be employed.

Dr. W. H. Pancoast, of Pennsylvania, first showed samples of black silk for sutures, which he preferred to the ordinary white silk, because the latter commonly contained impurities from lead salts. He then described his method of operating for varicocele, in which he employed a zinc button, and exerted great force in the tying of the ligatures. Here, also, he used strong black silk. Forty cases of amputation at the metacarpo-phalangal articulation were then instanced. In these he had, contrary to the method commonly in vogue, employed a volar flap. The success had invariably proved gratifying.

The great principle in the treatment of articular affections was rest, and not extension. The latter often had bad effects from irritation of the synovial membranes, which were the chief seat of disease. In the stage of spastic muscular contraction of such cases, tenotomy and myotomy were recommended as tending to relieve the spasm. In the advanced stages exsection alone could be relied upon. Extension would only aggravate the disease in those stages, because the synovial structures would be additionally irritated by the extending force. The hot iron was recommended as the most efficient revulsive in articular affections. Rest must be enforced, and suitable antiphlogistic treatment, combined with this, was far superior to any apparatus for permanent extension.

Dr. H. A. Martin, of Massachusetts, stated that a much thickened synovial membrane frequently simulated articular effusion. In his 240 cases of exploratory articular punctures, he had purposely abstained from using antiseptic precautions and had never found the slightest symptoms of inflammatory reaction.

Wednesday, June 2.

In continuing the discussion from the previous day, Dr. Martin said that puncture of joints was regarded by the profession at large as a *dernier ressort*, but, in his experience, it should be performed early. There is no danger in this procedure. His own investigations on the vascularity of joints tended to confirm Dr. Pancoast's views. Sir Benjamin Brodie supported the view of non-suppuration of cartilage, in inflammatory processes involving joints. Dr. Martin also showed his new adhesive plaster, made of India-rubber, in combination with Burgundy pitch and balsam of tolu. This plaster was devoid

of all tendency toward deterioration. United States Army Surgeon's Adhesive Plaster was the name by which it was already known by some members of the profession.

Dr. C. B. NANCREDE, of Pennsylvania, referred to Dr. PANCOAST's paper, and said that already irritated cartilaginous surfaces must be kept apart by extension to facilitate healing.

Dr. A. C. POST, of New York, observed that he had for some time past been in the habit of employing fine sutures of black silk. The prime factor in treating articular affections was rest to the synovial membrane, and not the removal of pressure from the articular cartilages.

Dr. HINGSTON, of Canada, in connection with Dr. PANCOAST's urethrotome, said urethrotomy was too often performed. Very frequently it was a quite superfluous and always a very dangerous operation. Dilatation was more satisfactory.

Dr. PANCOAST entirely agreed with Dr. HINGSTON, and explained that his instrument was often used only for superficial nicking, followed by the use of bougies.

Dr. CAMPBELL, of Vermont, asked how long the bougie was allowed to remain in the urethra.

Dr. PANCOAST answered, "As long as the individual exigencies seem to require."

Dr. JAMES L. LITTLE, of New York, read a paper on *Compound Complicated Hare-lip*, illustrated by three cases—all brothers, aged respectively 22, 18, and 9 years. They also showed cleft palate. No hereditary tendency was ascertained. There were five girls in the family; these were perfect.

Dr. JOHN L. ATLEE, of Pennsylvania, spoke of a family which contained seventeen members afflicted with hare-lip.

Dr. VANDERVEER, of New York, instanced several cases, which spoke in favor of early operations. Sir William Fergusson always operated twice.

Dr. ATLEE strongly advocated early operations.

Dr. W. F. WESTMORELAND, of Georgia, said he had operated on a child only eight days old.

Dr. L. A. SAYRE, of New York, had operated on a child four days old. The best time to operate was before the lips were actively employed for sucking. Dr. VAN BUREN had assisted at the operation. An anæsthetic was not employed.

Dr. H. McGUIRE, of Virginia, only saw one successful case in his practice.

Dr. HAMILTON, of Ohio, had operated on a child twelve hours old. Other operations were also cited in support of Dr. SAYRE'S views concerning the advisability of early operations.

Dr. D. H. GOODWILLIE, of New York, read a paper on *Naso-Pharyngeal Catarrh.*

Dr. A. C. POST, of New York, read by title a paper on *A Case of Torticollis rapidly and completely cured by open division of the sternal and clavicular origins of the sterno-cleido-mastoid, followed by elastic traction.*

A New Ether Inhaler, and a New Form of Transfusion Apparatus, was described by Dr. JOS. C. HUTCHISON, of N. Y.

A Paper on Hip-Joint Disease, by Drs. DE FORREST WILLARD and E. O. SHAKESPEARE, of Pennsylvania, was read by Dr. WILLARD.

Dr. JOHN B. ROBERTS, of Pennsylvania, read a paper on *Tapping of the Pericardial Sac.*

Dr. G. DOWELL, of Texas, referred to a peculiar case, where effusion was simulated by an entirely different pathological condition. In this instance tapping would probably have led to death.

Dr. C. A LEALE, of New York, read a paper on *Thoracentesis.*

Dr. ROBERT F. WEIR, of New York, read a paper upon *Cystotomy for Cystitis in the Male*, which embodied the results of forty-seven cases, in which the operation of cystotomy for cystitis had been resorted to.

Dr. J. W. S. GOULEY, of New York, remarked that no patient would get well after cystotomy unless there had been a free division of the urethro-vesical orifice. Rest alone would not effect a cure. Mercier had reported about four hundred cases of such division of the urethral valvule. The prostatic valvules were also incised by this physician. In some cases, however, even valvular division would not produce the desired result of an effectual cure.

Dr. W. W. DAWSON, of Ohio, concurred in the views expressed by Dr. GOULEY, and cited an interesting case which had been intractable to all the methods he had employed.

Dr. T. MYNTER, of New York, also had performed cystotomy, but after closure of the wound the patient's troubles had returned.

Dr. HART, of New Jersey, instanced a case where a drainage-tube had been placed in the rectum, allowing the residue urine to pass off in that way.

Dr. HAMILTON, of New York, said he had given infinite relief to a woman who had suffered intensely for a long time from severe cystitis. An ordinary soft catheter was allowed to remain in the bladder till relief was afforded, and permanent cure followed.

Dr. A. C. POST, of New York, referred to a case which had been commented upon by the author of the paper under discussion. The actual cautery had been applied in this case at two points over the hypogastric region. An absolute cure followed.

On motion of Dr. DAWSON, a committee was appointed to report what alteration, if any, were necessary in the by-laws, to enable members to publish papers read by them, either in whole or by abstract, in advance of the publication of the annual volume of the Transactions of the Association. Drs. BRONSON, DAWSON, and PANCOAST were appointed on this committee.

Dr. L. TURNBULL, of Pennsylvania, read a paper on *Skin Grafting*, with illustrative cases. The paper had been previously read before the Philadelphia County Medical Society, December 17, 1879.

Dr. BURCHARD, of New York, related a case of great interest, in which two hundred grafts had been taken from an amputated thigh, three hours after its removal, and inserted into an immense ulcerated surface over the breast of a woman. A stimulus had been imparted to the edge of the wound by the implantation of these cutaneous bits. Later on, five hundred grafts were placed on the ulcer. The extent of the wound considerably diminished after these procedures To Dr. Van Wagenen belonged all the credit of originality in this matter.

Dr. W. A. BYRD, of Illinois, read a paper on *Laparotomy and Colotomy with Formation of Artificial Anus for Intestinal Obstruction.*

Dr. GOULEY, of New York, agreed with Dr. BYRD in his condemnation of delay in doubtful cases. Still, time must be given to make sure of the diagnosis. A case was cited where delay had unquestionably led to death. Forty-seven other cases were instanced with only one recovery, and this in a case where an operation had been performed.

Dr. DAWSON remarked on the difference in danger between cutting into a previously unirritated peritoneum and one where continual irritation had already established a comparative tolerance of exciting factors. Some cases bearing on the subject

under discussion were then adduced. Fluid injections were also recommended preparatory to severer measures. Sometimes Dr. Dawson had found the fluid injected into the rectum escape at the mouth. Spontaneous cure might occur. Cutting into an acutely inflamed peritoneum was too dangerous a practice to justify a universal adoption of laparotomy for acute obstruction of the intestines. The difficulty of diagnosis in many cases of this kind was dwelt upon. Laparotomy should remain a last resort after failure of all other methods.

Dr. JEWETT, of Massachusetts, had found no difficulty in introducing rubber tubes into the rectum to the distance of three feet. A case of impacted feces, illustrating the utility of rectal injections of warm water by means of such rubber tubes was described.

Dr. GOULEY, of New York, said that abdominal section should be practised before peritonitis had set in. He then described an acute case which clearly showed that the policy of waiting was disastrous. In subacute and chronic cases post-peritoneal abscess would gradually develop, and in such cases did not indicate abdominal section.

Dr. J. R. WEIST, of Indiana, suggested that in cases where an operation was not practicable, great efforts would not always be rewarded by success. The let-alone policy had, in his experience at least, sometimes secured the most gratifying results.

THURSDAY, June 3.

Dr. F. N. OTIS, of New York, read a paper on *Pathology and Treatment of Syphilis.*

Treatment of Syphilis at the Commencement and End of the Nineteenth Century. By Dr. CHAS. R. DRYSDALE, of London, England. This paper was read by Dr. HUTCHISON, of Brooklyn.

Dr. HENRY A. MARTIN, of Massachusetts, said the late so-called tertiary and quarternary manifestations are simply sequelæ, and not necessary effects of syphilis. This view was in entire agreement with known pathological processes, and did away with the necessity of supposing a specific virus as the cause of the malady. In addition, he concluded, it was in the fullest harmony with recognized physiological and physical laws.

Dr. H. O. MARCY, of Massachusetts, read a paper on *The Development of the Osseous Callus in the Different Fractures of the Bones of Men and of Animals.*

Dr. NANCREDE, of Pennsylvania, took exception to the term necrosis of the periosteum, as employed by Dr. MARCY. He thought there was merely a return to the fœtal state of this membrane in cases of fracture.

Dr. HERRICK, of Ohio, thought that softening of the fractured ends of the bone always occurred. This, in his opinion, would account for the shortening resulting after fracture, in spite of the employment of extension.

Dr. SAYRE rose to a question of privilege, stating that the patient he had operated on for hare-lip was four hours old, and not four days, as had been stated in the report of the daily edition of yesterday's *Medical Record*.

Dr. H. G. PIFFARD, of New York, then spoke on *Lupus*. He stated his belief that the pathological significance of lupus was that of a scrofulous skin affection. Three varieties were given: 1. Superficial, non-ulcerative lupus, or erythematous lupus. 2 Ulcerative lupus with superficial ulcerations, never penetrating beneath the skin. 3. Lupus with deep ulcerations invading deeper tissues.

Concerning the application of the elastic bandage, as related to the treatment of articular affections, Dr. MARTIN said that the bandage should be applied with intermissions, otherwise vesication would supervene. Pain rarely attended the application of the rubber bandage; even a raw surface should not deter the surgeon from re-employing it, as this and similar conditions, however angry in appearance, were not essentially dangerous.

Some drawbacks, incidental to this method were then adduced. These were chafing, profuse sweating, and occasional extreme pruritus. The intervention of cotton or lint reduced such annoyance to a minimum. Washing with tar soap was useful in eczema; vaseline might also be employed. He is now in the habit of employing much thinner bandages than formerly.

Dr. NANCREDE, of Pennsylvania, warmly advocated antiseptic surgery, taking exception to Dr. MARTIN's views concerning it. The unanimous opinion of competent persons, in a certain Philadelphia hospital at least, was altogether in favor of Listerism.

Dr. H. F. CAMPBELL, of Georgia, read a paper on *Radical Cure of Inflammation by Ligation of the Vessels of Supply*.

The Section adjourned at 6 o'clock P. M., June 3d, *sine die*.

NOTE.—The following papers were received by the Committee of Publication as having been read before this Section, and referred, though not mentioned in the Minutes.

Some Points in the Treatment of Hemorrhoids. By WILLIAM R. D. BLACKWOOD, M.D., of Pennsylvania. *A Method of Treating Spinal Disease.* By E. H. COOVER, M.D., of Pennsylvania. *Treatment of Fractures of Long Bones involving Joints.* By JAMES S. GREEN, M.D., of New Jersey. *A new Appliance for the Treatment of Club-Foot and other Deformities.* By GREGORY DOYLE, M.D., of New York.

A PLEA FOR THE PREVENTIVE TREPHINE.

By W. T. BRIGGS, M.D.,

TENNESSEE.

MR. PRESIDENT AND GENTLEMEN:

In obedience to the requirement of the laws of the Association devolving upon the Chairman of each Section the duty of reviewing in the form of an address, such advances and discoveries as may have been made during the past year in the special department over which he was chosen to preside; or to perform the alternative of pronouncing an essay on some topic of large importance and general interest connected with that department, I propose within the limits of the allotted time, to discuss a surgical procedure than which none is older in the history of the science and art of medicine, and on which so much has been said and written, that it may be thought to have become trite, if not threadbare, viz., *the preventive trephine.* Parenthetically it is proper to remark, that the term trephine will be used in a comprehensive sense. Authors generally draw distinctions between the application of the trephine proper, and the employment of other instruments of the trephine case. It is difficult to appreciate the necessity of considering separately the operations by several instruments, obviously used for the same purpose. The operation, by whatever special instrument effected, is a means to the end, viz., the removal of fragments of the skull; and this paper will designate under the term trephining, any procedure adopted to accomplish that object.

It is hoped to enlist the interest of this body to some degree, notwithstanding the subject has been for so many eras in the history of surgery belabored by such various and contradictory views. The great importance of the proper treatment of injuries of the head, the frequency with which the question of life or death is involved in their consideration, and the formidable mortality attending such casualties, invest the subject with

paramount interest, and have induced me to select it as a theme for this occasion, in preference to others which would have the attractiveness of novelty. My choice was further influenced by strong evidences of a recently awakened interest in the subject both at home and abroad. It is not claiming too much to assert that a revolution of opinion in favor of the trephine is now in progress, and that a larger appreciation of its merits is now obtaining. There can be no doubt but that its field of usefulness is constantly widening, and it is confidently predicted that in the near future the operation will assume and maintain among surgical procedures enjoying full favor of professional esteem the just rank to which it is entitled.

Injuries of the head have engaged the attention and profound study of the most brilliant intellects of the profession in every age. The philosophical dictum of Hippocrates, "*Nullium capitis vulnus contemnendum*" has been strengthened by the accumulated experience of centuries. The close, compact structure of the bony envelope of the encephalon, its exposure to frequent traumatism by reason of its position, the high grade of sensibility of the brain, its ready susceptibility to the slightest irritation, the formidable and often fatal consequences of lesions of that organ, and the difficulties that intervene to prevent an accurate discrimination of the extent of involvement, all combine to render the subject a most important and interesting one.

That such a chain of circumstances should suffice to have engaged the master minds of the profession in the question of operative interference for the relief of head injuries, is not a matter of astonishment; but it is a grave reproach upon the profession, that with all its boasted advance in the acquisition of surgical knowledge, and in the perfection of surgical skill, it is yet not a whit nearer to the solution of this momentous question than it was many years ago. The most rational treatment of injuries of the head still remains a *quæstio vexata.*

If we take a rapid review of the past, we will be struck with the mutability of opinion concerning very many of the most important subjects pertaining to medicine and surgery. In every department of medicine we will observe the variable position that certain remedial measures and operative procedures have held in professional estimation at various periods.

Bloodletting, which only a few years since was practised the world over for the alleviation of almost "every ill to which

human flesh is heir," has been the subject of the most complete revolution, and is now so rarely practised in the treatment of disease as to deserve the designation of "one of the lost arts," recently given it by a distinguished member of this body.

The operation of lithotomy, for a long time practised as the only means of removing stone from the bladder, in the early part of its history was eclipsed and almost supplemented by lithotrity, introduced by Civiale. Experience fairly proved the inadequacy of the new method, and after a time the cutting operation regained ascendency. At the present time, lithotomy is again threatened by its old rival in a new guise. Litholopaxy, a new term applied to the crushing process, practised upon principles enunciated and demonstrated by Bigelow, has gained rapidly in favor since its recent introduction, and has already encroached upon fields hitherto appropriated exclusively to lithotomy.

Numerous other examples might be adduced illustrative of this fickleness of sentiment; but none would present a record of greater instability than the operation of trephining.

The voice of authority, the tyranny of fashion, but chiefly the difficulty and doubt that invest the subject, combine to produce this want of unanimity and confusion of ideas.

Recent communications in the *Bulletin de la Société d'Anthropologie*,[1] by MM. Prunières, Broca, Engelhart, etc., have conclusively proved that the operation of trephining was practised, either as a religious rite or as a surgical measure in prehistoric times.

The earliest authentic information of the trephine, however, is found in the writings of Hippocrates. He and his followers for several centuries, frequently employed it for a variety of causes. In the middle ages, the operation was not only performed by physicians, but also by strolling mountebanks (*circulatores*) and ignorant artisans, who bored the skull for the most trivial causes, and most generally, strange to say, with perfect safety.

Advocated by Pott, denounced by Desault, having engaged the best intellectual energies of such surgical celebrities as the Bells, Coopers, Hunters, and Quesnay, Abernethy, Dupuytren, Velpeau, Nélaton, and many others, by some of them approved,

[1] La Trepenation guidée par les Localisations Cérébrales, par le Dr. Juste Lucas-Championnière, Paris.

by some condemned; under their respective teaching, at one time high in repute, at another equally as low in the scale of professional esteem, the operation of trephining has descended to us with a checkered history of alternate rise and fall.

The views of representative surgeons of the present time, regarding the trephine, are equally as confused and unsettled as were those of our forefathers. They may, according to this opinion, be divided into three classes:—

1. Those who, like the extremists of old, absolutely reject the instrument, on the grounds that its use adds danger and complication to lesions already serious, and that the expectant treatment offers better chances of success.

2. Those who, while recognizing the great value of the trephine, regard it solely as a curative agent, and employ it only when there exists grave symptoms of cerebral involvement.

3. And by far the smallest class, those who accept the instrument as a valuable prophylactic, and urge an early resort to it in such cases as from the nature of the injury seem to demand it, in order to avert threatened danger.

It may thus be observed, that up to a comparatively recent period, the teachings of a large majority of surgeons would restrict the use of the trephine within exceedingly narrow limits. The present indications, however, are favorable to its more general employment, especially as a preventive. There is a growing disposition not only to resort to it more frequently in recent head injuries, but it is also being applied with increasing confidence and success in epilepsy, paralysis, and other remote effects of fractures of the skull.

Indeed, under the inspiration of the writings of Fritsche and Hitzig in Germany; Ferrier in England; Charcot, Broca, and Lucas-Championnière in France, and other distinguished psychologists and surgeons, whose experimental researches strengthened by clinical observation, have established the doctrine of cerebral localization, we are led to hope that a new and hitherto unexplored field for the operation is on the eve of being opened up to the profession. Influenced, then, by powerful tokens of a general awakening to the proper realization of the merits of the trephine, I am prompted to offer a plea for that instrument as a preventive agent, and if I succeed in exciting a spark of quickened interest in the subject, or in eliciting an unprejudiced criticism of the arguments I shall endeavor to advance, I shall

feel myself fully recompensed for the time and labor bestowed on the preparation of this paper.

It is quite a general opinion that the application of the trephine is justified only by urgent symptoms of grave intracranial mischief; and even then delay is often counselled until it is obvious that, notwithstanding the most active treatment, reasonable hope of recovery without operative interference cannot be entertained. In other words, the operation is to be performed only as a *dernier ressort* when every other chance of life has been despaired of, and death is already imminent.

Under such inauspicious circumstances, the trephine is appealed to, and is often made to bear the burden of the fatal result. In support of this practice, it is urged that recovery from even the most severe injuries of the head may take place without the use of the trephine, as evidenced by the numerous examples with which the annals of surgery abound.

The chief factor, however, in the production and maintenance of this pernicious doctrine, resides in the belief that the trephine is *per se* a dangerous instrument. It is certainly true that the mortality following the application of the trephine has been alarmingly high.

Of 45 operations reported by Lente, performed in the New York Hospitals, only 11, or about one-fourth of the number, recovered.

Erichsen says,[1] "Of 17 cases in which the trephine proper was used at University College Hospital, by Cooper, Liston, and myself, 6 patients recovered. . . . In the late American war, the results have been more satisfactory than the previous experience of army surgeons would have led us to hope. Of 107 cases of trephining, 47 recovered; and of 114 cases, where fragments of bone were removed by the forceps and elevator, without the use of the trephine, 53 recovered. The Parisian surgeons have not been very successful. Nélaton says that all the cases of injury of the head, 16 in number, in which the trephine had been used in the Parisian hospitals during fifteen years, terminated fatally."

Bryant says,[2] "At Guy's Hospital trephining and elevation of bone for head injuries have been performed in fifty-one cases during seven years, and of these only twelve recovered." The

[1] Erichsen, Science and Art of Surgery, vol. i. p. 559.

[2] Practice of Surgery, p. 177.

rate of mortality has been nearly as high in all the large hospitals throughout the world.

In considering these statistics, which place the operation in its most forbidding aspect, it must be remembered that the operations were performed by surgeons who were doubtless impressed with the procrastinating belief, that surgical measures were only justified by the exigency of symptoms.

The extreme gravity of accidents demanding the employment of the trephine, the postponement of its application to a period at which the secondary effects of the injury have already seriously compromised the result, are sufficient circumstances to account for this death-rate. Most assuredly, any capital operation subjected to such a test might, and with equal propriety, be condemned.

The trephine cannot justly be held responsible for this fearful mortality. No capital operation in surgery is intrinsically less dangerous. To become convinced of this fact, it is only necessary to refer to the numerous instances in which it has been performed, for the most trivial reasons, and by ignorant charlatans, with the most astounding success.

Velpeau mentions an instance in a man suffering from an old cephalalgia, who was trephined by a blacksmith, with perfect relief of his chronic trouble.

Bell reports the case of a young lady, who recovered after twelve applications of the trepan, in the hands of Marechal.

The most remarkable instance, however, of the harmlessness of the instrument is furnished by the well-known case of the Count of Nassau, who was subjected to twenty-seven applications of the trephine by his surgeon, John Chadbourn, and who afterwards was well enough to give a certificate, testifying to the great skill of his chirurgeon. Gross refers to a case reported by Schmucker, in which "the operation was performed eleven times in less than a month, and so little, he adds, was the patient incommoded by it, that he seldom went to bed after it."

Recent investigations have brought to light the fact that the operation was common among the cave-dwellers of the neolithic period. It is also known that the South Sea Islanders scrape through the skull with pieces of glass for the relief of headache, vertigo, and neuralgia.

Haytiens, Mexicans, and the Kabyles of Algeria trephine for fractures of the skull. With the miners of Cornwall, among

whom fractures of the skull are frequent, it is the rule to trephine at once, the operation being expected and urged by patient and friends. Dr. Michel reports that hardly a day passes without one, and sometimes as many as three, of these operations at the surgeon's office, the patients returning home afterwards.[1] There is certainly nothing in the character of the operation, when skilfully performed and with strict attention to the details so necessary in the dressing and after-treatment, to justify the common belief that it is intrinsically dangerous and therefore only warrantable *in extremis.* I regard trephining as one of the safest operations in surgery. My personal experience sustains this belief. In a large majority of my operations in recent injuries of the head no unpleasant symptoms ensued. In twenty-five operations performed by myself for the relief of epilepsy resulting from injuries of the skull, but one death occurred.

Conceding, then, the safety of the operation when skilfully performed and when practised before the development of the secondary consequences of the traumatism, it is proper to consider the circumstances which demand it and the objects to be attained by it. Most surgeons restrict the operation to cases of compression of the brain, whether that compression be the effect of accumulation of pus, extravasations of blood, or displaced fragments of bone.

Dr. S. W. Gross, in a most valuable paper entitled[2] "Causes, Diagnosis, and Operative Treatment of Compression of the Brain," says that more than one-half of all cases of compression are dependent on the formation of pus in the cranial cavity. Pott many years ago directed the attention of the profession to this complication, and advocated the use of the trephine for the evacuation of the pus. Influenced by his brilliant success, other surgeons adopted his treatment, and in many cases the operation was followed by the most successful results; but the practice of modern surgeons has been signalized by almost constant disappointment.

Prescott Hewett says:[3] . . . "The successful issue of trephining for matter between the skull and dura mater is all but unknown to surgeons of our times."

The discouraging results of the operation in this class of cases

[1] Amer. Journal Med. Sciences, Oct. 1879.
[2] Ibid., Oct. 1879.
[3] Holmes's System of Surgery.

of late years are attributable possibly to needless delay in operative interference. The invariable practice of Pott was to open the skull, and give exit to the pus at the first indication of its presence, and his wonderful success attests the importance of observing this rule.

When it is certain, then, that intra-cranial suppuration has taken place, the same general principles should be observed in the evacuation of the matter, as in abscesses elsewhere, if it can be accomplished without too much injury to surrounding parts. It is of the first importance that the operation be performed under these circumstances at the earliest possible period. The pent-up matter acting as a foreign body causes an extension of the inflammatory action, and a consequent increased area of the abscess. Every moment of delay, therefore, diminishes the chances of success.

There can be no doubt but that the frequency with which compression is due to pus formation would be notably lessened were the preventive trephine more commonly employed. It is very true that the hopes to be placed upon the application of the trephine subsequent to the process of suppuration are at best small; but it is just as true that the necessity for its application in this condition might often be avoided by the early removal of the exciting causes of this event.

In compression from extravasated blood, the great difficulty of determining accurately the location of the clot and the high rate of mortality, with or without operation, attendant upon that condition, are sufficient to cause the boldest operator to hesitate before resorting to the trephine. A distinguished author has declared that the modern annals of surgery do not contain any cases in which life has been saved by the trephine in this state of things; and yet, if from the nature and situation of the wound, or from symptoms referable to lesions of certain parts of the brain, the coagulum can be definitely located, even if it is in the arachnoid sac, it will be proper, in my opinion, to resort, at the earliest moment, to the operation, in order to avert consequences that will inevitably ensue and produce a fatal result if the clot be not removed.

Compression resulting from depressed portions of the fractured skull is considered by Jonathan Hutchinson to be "an imaginary state," and he declares "that he has never seen a case in which there were definite reasons to think that depression pro-

duced the symptoms." Whether the symptoms, for the relief of which modern teaching advises recourse to the trephine, owe their origin to compression of the brain by depressed bone, or to concomitant lesions of that organ, is a question as yet unsolved. No well-marked line of symptoms, as far as I am aware, can enable the surgeon to know that in any given case, he has to deal with simple compression, or with contusion or laceration of the cerebral substance.

The effects of compression of the brain by depressed bone, if uncomplicated, are temporary and will soon disappear. The facility with which the brain accommodates itself to pressure is well known.

John Bell has well said, that[1] . . . "If the patient be not struck insensible the moment the bone is beaten below its level, he can never become so. The brain is capable of accommodating itself to any degree of pressure, which is fixed and stationary, and that arising from a depression of the skull is so slight that it can hardly be estimated, for the depressed portion is a very small segment of a large circle, the broadest depression possible is not equal to one-tenth of the whole convexity of the cranium."

To trephine for the purpose of relieving compression, caused by depressed bone, is then a work of supererogation; and were the objects of the operation limited to such an effort, or to removing the serious consequences of cranial lesions already existing, the benefits to be derived from it would be extremely problematical. Intracranial inflammation is always threatened in depressed fractures of the skull, not only as the result of irritation excited by intruding fragments, but also of the injury to the brain and membranes invariably coincident. Were the inner surface of the depressed bone smooth and regular, the brain would tolerate almost any amount of pressure; but the impingement of sharp, rough fragments upon that delicate organ, already more or less injured, is certain to provoke a high and perilous degree of inflammation. The chief elements of danger, then, in depressed fractures is not the compression of the brain, but the irritation set up by the displaced bone.

The special object of the trephine, in my judgment, is to remove these sources of irritation, and thereby prevent the development of pathological changes, which when they occur,

[1] Bell's Surgery.

cannot be controlled. To prevent disease, to stop its very beginnings, is one of the highest duties of the surgeon. To remove the cause is one of the first, as well as one of the most important, steps in the treatment of every disease. The same principles should direct the surgeon in the treatment of head injuries, as in diseases and injuries of other parts of the body.

The indications are here clear and distinct to remove localized sources of irritation, in order to prevent or limit the inflammatory process.

In many cases the removal of the cause will be sufficient of itself to prevent the serious consequences that might result; but more frequently it will be necessary, in addition, to resort to the most judicious after-treatment. Often life may be preserved by appropriate treatment after the use of the trephine in cases in which general treatment would avail nothing without it.

To carry out this all-important indication the operation should be performed at the earliest possible moment. The early trephine is gold, the late trephine lead.

An illustration of the principle upon which the practice of preventive trephining is based is well shown in punctured fractures of the skull. In this class of fractures the injury to the outer table is insignificant, while the internal plate sustains nearly always the most extensive comminution.

The ancient belief that this condition obtains on account of the greater brittleness of the internal table, has recently been proven erroneous. Mr. Trevan,[1] of London, by a series of well-conducted experiments, has demonstrated that this difference in extent of fracture in the two tables of the skull, occurs in obedience to a well-known physical law, viz., *that fractures always commence in the line of extension, not in that of compression.* Symptoms of compression seldom result from punctured fractures, owing to the small size and spiculated character of the fragments; but the irritation produced by the sharp extremities of the broken pieces impinging upon or driven into the brain is sooner or later followed by inflammation of such great intensity, that a fatal result almost inevitably ensues. To prevent this complication, the universal practice is to trephine immediately, without awaiting the development of symptoms. The promptest interference is necessary in order to anticipate and avert

[1] Medical and Surgical History of the War of the Rebellion.

symptoms, the presence of which in all other fractures is the signal for operation. The value of the preventive trephine in this class of injuries is unchallenged. Fully cognizant of the lurking dangers in this form of injury, authorities, almost without exception, advocate the operation at the earliest possible moment. Yet the same physical law that presides over punctured fractures, determines to a certain extent the conditions of all others. In every fracture of the skull the internal table is likely to be more extensively broken than the external, and the more nearly they approach the punctured fracture in form, the more apt is this condition to follow.

If authors so entirely agree upon the propriety and necessity of trephining as a precautionary measure in punctured fractures, it is difficult to appreciate their great aversion to a similar use of the trephine in other fractures, the general conditions of which are often so nearly analogous. The same danger threatens, and it stands to reason that the same treatment is legitimate and proper.

There is a great prejudice existing in the minds of the profession against the employment of the trephine either curative or preventive, in simple fractures of the skull. Many who do not hesitate to operate in compound depressed fractures attended with symptoms of progressive cerebral involvement, are very reluctant, if not totally averse to the same procedure, in simple fracture. In their opinion, the propriety of operative interference is to a considerable extent dependent upon the integrity of the scalp at the seat of injury. It is affirmed that if the extent of the cranial lesion is exposed by a scalp wound, the operation is justifiable under certain circumstances; if on the other hand, the scalp is unbroken, no matter how severe the injury, or how urgent subsequent symptoms, the operation is contraindicated. In this opinion an undefined and unwarranted fear is expressed as to the risks of converting a simple into a compound fracture. I must confess a total inability to comprehend the philosophy of a sentiment so widely current. Fractures of the skull are dangerous in proportion as they threaten the brain and its meninges. The difference in degree of danger in compound and simple fracture, is more imaginary than real. Compound fractures, it is true, are usually followed by suppuration, but this process most frequently is limited to the wound and can only

become an additional source of danger when the wound is closed and the matter permitted to accumulate within the skull.

Besides, under the widespread influence of Listerism the risks of suppuration have been greatly diminished. Wounds made by the knife, treated antiseptically, now heal with as little disturbance, local or general, as subcutaneous wounds. Let us hope that the benefit conferred upon operative surgery in general by this protective system, may be extended to the operative surgery of the head, and that under its influence the profession may be led to adopt the most rational course of treatment in head injuries, and overcome the groundless apprehension of converting simple into compound fractures. A clean exploratory incision can add nothing to the harm already produced by the fracture; but by exposing the extent of injury, it can do much towards enabling the operator to recognize and avert dangers that would otherwise be necessarily concealed.

When, therefore, a simple fracture of the skull is markedly depressed or comminuted, or when symptoms of cerebral irritation traceable to the fracture exist, the scalp should be incised, and such further steps taken as a fracture originally compound should demand. When any doubt as to the nature and extent of the injury is entertained, the surgeon should in every instance give the patient the benefit of the doubt by freely exposing to view the seat of the injury. This is the more frequently necessary on account of the great difficulty, if not impossibility, of ascertaining definitely the condition of simple fractures of the skull. The swelling that rapidly supervenes or the location of the fracture beneath thick muscles, often effectually masks the character of the injury. For these reasons I have closely observed the rule, during a practice of thirty years, of converting a simple into a compound fracture whenever the nature of the case seemed to demand it, and I have never had reason to regret having done so.

All things considered, the danger of leaving depressed bone which is at all likely to provoke cerebral irritation, is equally as great in simple as in compound fractures; and the same principles that guide the surgeon in the treatment of the one, should influence him in the other. Certainly the risk, if there be any, of converting a simple into a compound fracture, can by no means equal the positive harm that threatens the integrity of the brain and its meninges, if no operative steps are taken.

The most difficult class of cranial fractures with which the surgeon has to contend, are those in which extensive depression or comminution of the internal table occurs, while the external escapes unhurt, or is only fissured, or fractured without depression. When a distinct fracture of the external table or even the slightest fissure of the skull can be detected, accompanied with urgent and threatening symptoms of cerebral involvement, there should be no hesitation in promptly resorting to the operation. If, however, no fracture or fissure can be discovered and the symptoms of cerebral irritation are well marked and persistent, the greatest care and judgment should be exercised in order to interpret at an early period their significance. If they should clearly point to a localized focus of irritation, the exploratory trephine should be used; for while the records of surgery furnish but few encouraging instances of tentative trephining, and while it must be admitted that such a procedure offers but slender chances, yet it cannot materially aggravate the danger, and may now and then be the means of saving life.

The propriety of resorting to the trephine for the relief of fractures of the internal table, for the evacuation of pus, or for the removal of extravasated blood without corresponding fracture of the external table, or even a wound of the scalp, has, of late, become inseparably blended with the subject of cerebral localization. The discovery of psycho-motor centres in the cortical substance of the brain, from which proceed impulses that determine the action of certain groups of muscles, promises to shed much light upon this obscure and difficult subject. Based upon rapidly accumulating clinical evidence, as well as upon physiological experimentation, cerebral localization is, indeed, fast assuming the proportions and dignity of an exact science. To what further extent the development of this subject may influence the operative surgery of the head remains to be seen; but it is safe to affirm that important facts already discovered have accomplished much towards the removal of formidable obstacles to accurate diagnosis of obscure injuries and pathological conditions of the brain, and have inspired the hope that the theory may prove of great practical value in locating the proper place for the application of the trephine.

The motor area is located beneath the anterior half of the parietal bone, and the motor centres of the muscles of the face, arm, and leg, which chiefly interest the surgeon, are grouped in

that area on either side of the fissure of Rolando. The site of this fissure can, by means of well-established measurements, be mapped out on the scalp with sufficient accuracy for all practical purposes. If after a violent blow upon any portion of this area, without appreciable cranial lesion, certain functional disturbances limited to a group of muscles, appear, whether in the form of convulsions, or of motor or sensor paralysis, the surgeon is justified, according to this theory, in applying the trephine over the affected centre. The instances in which applications of the trephine have been guided by localization, although serving to add valuable testimony to the truth and importance of the doctrine, are, as yet, too few in number to have much weight in deciding the measure of practical good to be derived from it. The cases of Broca, Proust and Terillon, and Lucas-Championnière are remarkable examples of the precision with which obscure lesions have been found by means of motor disturbances depending upon limited cortical traumatism. The following case in my own practice is strongly illustrative of the advantage to be derived from the correct interpretation of the laws of motor disturbances.

A lad, fourteen years of age, received a kick from a horse upon the anterior half of the right parietal bone. He was rendered insensible for several hours, and, upon partial recovery from that state, he complained of great pain in the part struck. He lay on the left side, body and limbs strongly flexed with frequent *convulsive movement of the left arm.* The pupils were contracted, and the pulse was quick and irritable. The scalp at the seat of the blow was much swollen and contused, but unbroken. No fracture could be detected. Thirty hours had elapsed since the accident when I first saw him, and the symptoms had grown progressively worse.

A flap of integment was turned back and the bone exposed. The skull was found fractured, but not depressed. Three applications of the trephine were made, and the fractured bone removed, when it was discovered that the internal table had been broken into a number of fragments, one of which had pierced the brain. The fragments were removed, and the patient proceeded to uninterrupted recovery.

In the above case the lesion was confined to the centre that presides over the muscles of the arm, and the irritation caused

by the impingement of sharp fragments upon that centre gave rise to the convulsive movements which led to the operation.

The principal obstacle in the way of utilizing more generally this doctrine resides in the fact that the lesion is seldom limited to the small portion of cortical substance representing a motor centre; but is diffused over a considerable space, and, therefore, the functional derangement is not sufficiently individualized to indicate definitely the location of the trouble.

Besides even if the motor disturbances are at first limited, they will, in a short time, become general from the extension of the morbid action to adjacent parts of the brain.

It may thus be observed that the instances in which localization will prove of value will be confined to the exceptional cases, in which the traumatism is limited, and even then will depend, to a great extent, upon a correct interpretation of the motor disturbance.

There can be no doubt but that the surgery of the head will be immensely benefited and elucidated by farther elaboration of the subject. The effects of the theory may be already seen in the new interest that has recently arisen concerning an old subject, and in the increased number of advocates of the advantages of the preventive trephine.

If in the future it does nothing more than guide the surgeon to a more systematic and intelligent diagnosis of obscure fractures of the skull, it will have contributed not a little to the science of surgery.

I think it may be safely affirmed, then, that in all depressed fractures of the cranial vault in which, either from the nature of the fracture or from symptoms that reveal themselves after shock has passed off, intracranial inflammation may be apprehended, the trephine should be resorted to at the earliest practicable moment.

The results of the operation of trephining performed as a preventive measure, though the cases are as yet comparatively few in number, bear powerful testimony to its superior advantages. Sédillot, in a paper communicated to the Academy of Sciences of Paris, has shown by statistics based on 106 cases collected from various sources, that the mortality following head wounds was in proportion to the delay in the employment of the trephine. Two-thirds of the cases were saved by the preventive trephine; more than one-third by early trephining; less than

one-third by retarded trephining; and one patient only recovered out of twenty-nine cases in which no operation was performed. My personal experience, embracing forty-two operations performed as a prophylactic in recent injuries of the head, with the result of thirty-eight recoveries and but four deaths, strengthen the statement of Sédillot.

The deductions to be drawn from these facts are:—

1. That extensively comminuted or depressed fractures of the skull are almost invariably fatal without operative measures.

2. That curative operations are but little better than the expectant plan of treatment.

3. That the preventive trephine offers the best chances of successful issue.

In the operation of trephining, as in most other capital operations, each case to a certain extent establishes its own rules. It may not be improper, however, to invite attention to a few essential points that should be observed in every operation, as very often such attention, even more than the operation itself, may determine the result.

1. The antiseptic method should be carried out in all of its minute details in every operation of trephining. It is only necessary to compare the surgery of to-day with that of a few years ago, to appreciate the beneficent effects of the antiseptic treatment of wounds. Pyæmia, septicæmia, erysipelas, etc., are as rare now as they were formerly common. Under the protective influence of Listerism, the death-rate of every operation has been greatly diminished, and we may hope that the same results will follow the surgical treatment of head injuries.

2. The conical trephine should always be employed. The construction of this instrument is such, that with the exercise of even moderate caution, the much dreaded risk of wounding the membranes of the brain is reduced to a minimum.

3. All loose fragments or spicula of bone or sharply depressed fragments should be *entirely removed.* The usual practice of elevating depressed bone not entirely detached from adjacent parts of the skull, is objectionable. If the depressed fragment is of large size, and connected by a broad isthmus of bone to the skull, it may be safe to simply raise it to its proper level. In my opinion, however, it is far safer to expose a large surface of the membranes of the brain by the removal of such fragments, than to leave them to become necrosed from insufficient circula-

tion, or to conceal beneath them a more extensive fracture of the internal table. Even should detached or partially detached fragments become united to the bone from which they had been separated, some inequality of the uniting material may be developed and in the future become the exciting cause of epilepsy or other serious trouble.

4. Especial attention should be devoted to the dressing and after-treatment. The practice of closing the wound with sutures or adhesive plaster is always fraught with the greatest danger. Head wounds communicating with the cranial cavity should be treated openly in order that fluids, the necessary and inevitable products of inflammatory action, may escape as they are formed; otherwise they will be retained and make pressure upon the brain to such an extent as to produce symptoms of compression.

In no other operation is there greater necessity for free and thorough drainage. In one of the few fatal cases occurring in my practice, death was directly caused by neglect of this precaution. The wound was dressed by the open method, and for three days the patient did so well that the attending physician, on the fourth day, thought it time to close the wound. As a consequence, in eight or ten hours the patient went into a comatose state. The wound was reopened and a large quantity of fluid allowed to escape. The coma passed off, but violent inflammatory action set in, to which the patient rapidly succumbed in spite of active treatment.

It may be seen from this review of the operation of trephining, that it has been the subject alike of abuse and neglect. It has been held responsible for results unjustly ascribed to it, and that should properly have attached to the erroneous principles which have too frequently governed its application. The neglect—not to say ostracism—it has received has been due to failure on the part of the profession to appreciate the fitness of time and conditions for its use, and the great object of prevention rather than that of remedy for results of cranial injury.

And the opinion is earnestly expressed, that, under advancing knowledge of its true mission, the surgeon who continues to disregard its manifest advantages will deprive himself of one of the most important and efficient instruments in his armamentarium. Judiciously employed, it will prove itself a most potent agent for the relief of mischief of far-reaching consequences, and a boon to surgery.

If only adopted and applied, however, on an over-cautious and halting theory, that some grave result of cranial lesion must exist before it is justified, while actual harm may follow, certainly no good can be effected. It is the history of our art, that surgeons by confining themselves to the narrow view that the trephine, if advantageous at all, was only so as a curative agent, have not attained successful results; but on the other hand have met with such frequent disappointment, that confidence in the operation has reached its lowest ebb.

Under the principles endeavored to be enforced in this paper, and which are attracting the best thoughts in the profession, let the instrument receive a fair and careful trial as a preventive, and it is confidently believed a tide of results far different and highly beneficial to science and humanity, will set to flow, that the operation alternately extolled and condemned by great names in surgery, entering the crucible of experiment, under this theory, as ore, will emerge pure and virgin gold.

SECTION OF THE INFRA-ORBITAL AND INFERIOR DENTAL NERVES FOR NEURALGIA.

By JOHN T. HODGEN, M.D.,

MISSOURI.

The operations usually performed in the section of these nerves are tedious and difficult, and result in deformity. Those which I now describe and have repeatedly performed, are easily and rapidly executed and leave no deformity.

In making the section of the infra-orbital nerve, it is proposed to divide the nerve in the spheno-maxillary fissure, and in the report of this operation, made by myself to the Missouri Medical Association in April, 1876, I gave credit to Dr. John Green, of St. Louis, for the suggestion as to the mode in which this section may best be made. He proposed that an opening be made on the inferior border of the orbit down to the bone; that an elevator be then used to separate the soft parts from the orbital plate of the superior maxillary bone, and reaching the posterior border of this surface, the nerve is found lodged in the groove terminating in the infra-orbital canal.

With a blunt hook, having a curve about one-sixteenth of an inch from its end, the groove in the bone at its posterior part is readily found. It is well known that the infra-orbital canal runs almost directly backward from the infra-orbital foramen, and that this foramen is situated directly under the middle of the palpebral fissure, and two lines below the border of the orbit.

The groove at the posterior part of the canal being found by the blunt hook, the hook is moved to the inner side and is pressed hard upon the bone, and pushed backward until it passes over the posterior border of the orbital plate of the superior maxillary, and is then turned outward, and made to sweep behind the posterior termination of the groove in which the infra-

orbital nerve and artery are lodged. Thus both vessel and nerve are caught in the hook. A straight, narrow scissors, guided by the shaft of the hook, is carried backward between the hook and the orbital plate of the superior maxillary, until the nerve is reached; it is then cut. To this proposition of Dr. Green I added the following part of the operation: It consists in separating the soft parts from the facial surface of the superior maxillary, down to the infra-orbital foramen. The blunt hook is made to sweep round this foramen, and thus the infra-orbital nerve and artery, at their exit from the bone, are hooked up; using the hook as a lever, the nerve is readily drawn out of its canal, and the portion of it which extended from the sphenoidal fissure to the infra-orbital foramen is thus removed.

To make sure that the union will not again be accomplished along this track of removal, a needle carrying a double ligature is passed through the incision below the orbit, and made to terminate in the mouth behind the upper lip. Through the loop before the ligature is drawn through after the needle, is placed the now loosened end of the nerve, and as the loop is drawn through, the nerve follows, so that the end which formerly occupied a position at the spheno-maxillary fissure is now lodged on the mucous membrane of the mouth under the upper lip. A careful regard to the anatomy of the parts will enable any one to perform this operation. I have been surprised to have so little extravasation of blood within the orbit after the section of the infra-orbital artery as it enters the infra-orbital canal.

One can make sure that the nerve is completely divided at its entrance into the canal, from the loss of sensibility of the lower lid, the side of the nose, and one-half of the upper lip of the side corresponding to that operated upon. The operation after section of spheno-maxillary fissure will of course be painless.

The other operation, that of section of the inferior maxillary nerve, I have proposed and done as follows:[1] With a strong knife a cut one inch long, well down to the bone, is made in the length of the bone, beginning at the base and a little to the inner side of the most prominent part of the coronoid process of the inferior maxillary bone, and extending forwards. The periosteum is now separated to the width of one fourth of an inch, and a small spear-pointed drill driven by a dentist's engine

[1] See Transactions of the Missouri State Medical Association, 1876.

has its point placed one-fourth of an inch in front of the posterior termination of the incision in the soft parts before mentioned, just behind the site of the last molar tooth. The drill is directed downward, backward, and a trifle outward. The firm shell of bone is penetrated and quickly passed. Any unequal resistance to the right or left after coming into the cancellated tissue of the ramus of the bone, will indicate to the surgeon that the hard shell on the outer or inner side is being cut. If the drill is spear-pointed, as directed, it will not cut through this dense bone on the sides, but will follow the cancellated tissue in the centre. In a few seconds the canal containing the bloodvessels and nerve will be reached and its thin wall opened. A severe twinge of pain and a free flow of blood will announce that the nerve and vessels have been cut, and this should be done as near as possible to the posterior dental foramen. (I will just here remark that, in this operation, I have never seen sufficient hemorrhage to excite the least anxiety.) A burr is now made to substitute the small drill. With this the opening is enlarged, and the nerve is again reached. This, of course, may be known by the pain which is felt by the patient when the central end is touched. The burr is directed forward, and the nerve is cut towards its distal termination. The burr is moved freely to the right and left to make sure that all the fibres of the nerve are severed. Of course the loss of sensibility in the lower lip and chin will indicate the success of this step of the operation.

The next step in the operation is the withdrawal of the nerve from the canal between the posterior dental and mental foramina. An incision is made opposite the bicuspid teeth, at the junction of the lips with the gum. The soft parts are then detached with an elevator down to the mental foramen. The blunt hook is made to pass around the foramen, and thus hook up the nerve. The hook is used as a lever, and the distal termination of the nerve being next to the loop, the portion occupying the body of the bone is drawn out; of course breaking off those filaments that go to supply the teeth.

Since February, 1874, I have divided the infra-orbital and superior maxillary nerves twenty-four times on thirteen patients, as follows:—

Case I.—Judge B. had suffered nine years with an intense pain in the infra-orbital nerve. All the teeth of the half of the upper jaw had been drawn February, 1874. I made a V-shaped

incision over the infra-orbital foramen, and trephined its facial surface. I broke down the inferior wall of the orbit, and removed about an inch of the nerve. He was free from pain until April, 1876. In October, 1877, the operation was repeated. I found the nerve had been reproduced. After this he had no pain for four or five months. In October, 1878, I operated again; this time by the method which I have now described. Since that time he has not suffered the same character of pain that he had before the operation, but he has had occasional attacks of neuralgia; not so severe as to incapacitate him for work.

Case II.—Jos. B., aged sixty-two. Been suffering with neuralgia of the lower jaw two years; operated July, 1874. This operation consisted of severing the inferior maxillary nerve, as above described, and with a burr cutting out a section, perhaps three-fourths of an inch. In November, 1874, he reports himself well. I know nothing of him since.

Case III.—Mrs. Sarah M.; had neuralgia in the lower portion of the face twenty-five years. All the teeth of that side of the lower jaw had been removed. I divided and drew out the nerve January, 1875; she was entirely relieved of pain. June 24, 1875, she writes: I have had some slight indications of return. October, 1878: I had no pain for a year; the pain returns at intervals; I am sometimes free from pain two or three months at a time.

Case IV.—Mrs. L., a feeble woman, aged 55; suffered ten years. Pain referred to the lower jaw; cut the inferior dental June 25, 1874. Was entirely free from pain until May, 1875, when she suffered again. November 14, 1875, I divided and drew out the inferior dental nerve; since that time there has been no pain in the inferior dental. The patient suffered from infra-orbital neuralgia, June 25, 1876; I cut and drew out the infra-orbital nerve; since that time she has been entirely free from pain; has grown fleshy and strong.

Case V.—J. B. C., aged 47; suffered nineteen years. February 12, 1876, I trephined superior maxillary, broke down the floor of the orbit and removed one inch of infra-orbital nerve. May 24, 1876, he writes: I have suffered slight pain since in the lower jaw during changeable weather. In 1879 he writes: I am entirely well.

Case VI.—A. H. H., perhaps aged 50 years; been suffering

nine years with neuralgia of the inferior dental nerve. In November, 1875, cut and drew out the nerve. April 16, 1876, he suffers very little; has pain in the upper jaw and upper lip. April 15, 1877, cut and removed the infra-orbital. Pain returned in two weeks after the operation; has continued, though not so severe pain, generally at night.

Case VII.—J. B. C., aged 47; suffered nineteen years, infra-orbital nerve; operated February 12, 1876. May 24, 1876, writes: Suffered slight pain since the operation, in the lower jaw, especially during changeable weather; 1879, he is entirely well.

Case VIII.—Mrs. P., aged 65 years, a delicate lady; suffered five years. May 10, 1878, divided the inferior dental, and attempted to draw it out. The nerve broke and was not satisfactorily removed; free from pain for eight months. May 10, 1879, cut the nerve again, and drilled the bone at numerous points, perhaps moving a section an inch and a half long; has had some pain since the last operation, but has suffered much less than before.

Case IX.—O. F. B., aged 46; suffered fifteen years; inferior dental; operated on October, 1878; no pain for twelve months, and the nerve was not satisfactorily removed. March, 1880, returned suffering; the nerve was again divided, the bone drilled at several points, I think I removed one inch and a quarter, perhaps, at the last operation; the pain was at once relieved; I have not heard from the patient since.

Case X.—Dr. P., aged 60; a robust man, suffering neuralgia of the left inferior dental nerve in 1876. I cut the nerve, but did not successfully draw it out of the canal, October 29, 1879; he was entirely relieved for seven weeks. On the 15th of February, 1880, I drilled the bone again without relief. On the 24th I again drilled the bone at a number of points, the first point being further back than before. A good deal of inflammation followed, but there was no more of the old pain.

About April 1st, 1880, had hemiplegia involving the left side, from which he is slowly recovering. Memory is failing, intellect feeble. Dr. Stevens, of Chillicothe, reports, May 26, 1880, "a loud systolic murmur; impulse very marked." The patient has probably aortic insufficiency and consequent hypertrophy of heart.

Case XI.—Dr. L., age 35, March, 1876, has had severe pain

in his upper jaw, left side, beginning about the second bicuspid tooth. Dr. Y., of Louisville, removed an exostosis from the lower jaw, thinking this might be the cause of the pain. The part was so sensitive that the wind blowing on his mustache excited excruciating pain. Removed the infra-orbital nerve February 6, 1877. Immediate relief followed. The face became very painful and much swollen. Three days later the old pain returned for a short time. During this time he suffered pain in the wrists and knees, recurring every four hours. Pain both in the face, wrist, and knees, disappeared after the use of large doses of quinine. A year later severe pain returned, but in the inferior dental nerve. September 5, 1879, removed the inferior dental nerve. For a week or ten days had slight pain, but of a different character and associated with soreness from the operation. Had no pain to the time of his death from pneumonia, December 14, 1879.

Case XII.—William K., aged 43; been suffering seven years; severed but failed to completely remove the inferior dental nerve in May, 1878. Remained well seven months. Operated again January, 1879, drilling the bone in two points. Was free from pain one year. January, 1880, pain returned, and a third operation was performed. Is well at the present time, May, 1880.

Case XIII.—W. A. K., aged 32 years; pain in the superior maxillary, beginning six years ago. One morning while washing his face, he suddenly felt a severe pain under the right eye. Pain was so severe and the shock so sudden, that he came near falling. Lasted but a few moments, then disappeared. Second attack four months later. Attacks involving the branches of infra-orbital have been very frequent since that time and lasting usually about five minutes, the longest interval between the attacks being two months. In winter the attacks usually have been less severe than in summer. Operated May 24, 1880, cutting the infra-orbital nerve: the removal was not satisfactory, but the patient is entirely free from pain at present, May 26, 1880.

THE MECHANICAL TREATMENT OF SOME OF THE MORE COMMON ABNORMAL CONDITIONS OF THE FOOT.

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Every surgeon in large practice has many cases brought to his notice of weak ankles, inverted feet, and the commoner forms of clubfoot, which are not sufficiently grave to need operative procedure, and for which our mechanical contrivances have hitherto been crude and insufficient, because not strictly physiological.

It will be my aim in this short paper to lay before you a plan of treatment differing in many points from any in use, avoiding all pathological and anatomical descriptions, except those which are necessary to the proper understanding of the mechanical treatment, as this department alone is embraced by our subject.

WEAK ANKLES.

The foot is made up of twelve bones, which in the normal condition are held closely and harmoniously together and may be considered, as far as the ankle is concerned, as one piece, since only one of its bones—the astragalus—comes in contact with the bones of the leg, this articulation constituting the ankle-joint. This joint permits of two free and two limited movements of the foot, "extension and flexion, and inward and outward rotation." The foot is retained at its proper angle by a series of muscles, so exquisitely adjusted that a perfect balance of power exists between them; but let this balance be destroyed, and the harmony of the arrangement is lost and deformity occurs.

This loss of power in the muscles may be limited to one, or several, or may embrace them all. The greater number of cases, however, are those in which the anterior muscles of the leg are impaired, the predominant symptom being a dropping of the

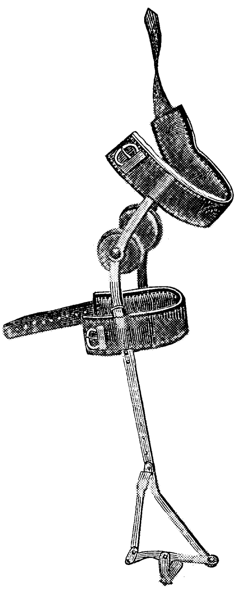
foot—the anterior half more than the posterior—with diminution of power to keep the foot at a right angle, or to lift the toes while walking. When this is not complicated with changes in the structure of the foot, the latter may either invert or evert as chance may direct, but the tendency is to invert in the majority of cases.

The external and internal supports are also weakened, and the ankle gives way laterally, especially externally, on the smallest provocation.

The treatment of the uncomplicated condition is mechanical and physiological. The mechanical treatment consists in supplying, as far as possible, the muscular power of the anterior of the leg, treating the foot as a whole, giving, at the same time, lateral support.

It is then necessary to use a brace, which will allow all the motions of the ankle-joint, and yet be provided with constant elastic power of sufficient force to keep the foot at a right angle when at rest, and afford the extended muscles a chance to contract and revive under the influence of the physiological treatment.

Fig. 1.



I have devised for this purpose a brace which fulfils these conditions, and fulfils them perfectly, and supplies a want long felt in orthopædic surgery, for an apparatus which can be worn with the patient's ordinary shoes, and yet be detachable at pleasure. (Fig. 1.)

It consists of a steel strip parallel with the leg and worn externally, so as to interfere less with locomotion, and be opposed to the side towards which flexion takes place; connected above with a leg girth and extended below at an angle to the back of the heel, where it is hinge-jointed with a horizontal strip whose anterior extremity is connected with the vertical strip above the point of divergence by an elastic cord, which may be lengthened or shortened at will.

The horizontal strip is riveted to a strong strip passing under the instep, perforated in the centre to allow the insertion of an

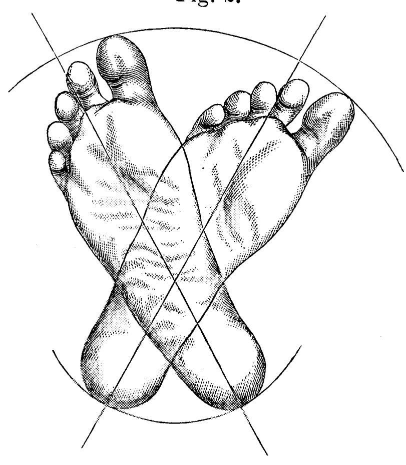
oblong pin attached to a plate fastened into the arch of the shoe. This pin may be turned around after such insertion, and then forms both a firm attachment and a pivot, and is situated in the centre of motion of the foot.

The points for which I assume originality and excellence in this arrangement, are: 1st. Placing the hinge-joint at the back of the heel, instead of over the ankle-joint as in every other form of apparatus, thus greatly increasing the leverage, and in connection with elastic power anteriorly, which may be augmented as desired, preventing the toes from dropping beyond a desired line, producing a constant elastic power vertically, which causes the foot to assume any desired angle with the leg. 2d. Making the brace and shoe distinct and connecting the brace with the shoe, only by a detachable pivot in the centre of motion of the foot, and to the leg by a girth allowing them to be removed at pleasure.

The pivot insertion below allows the foot to be everted or inverted at will, without in the least impairing the support of the ankle; and any apparatus like those now in use, which allows motion of the foot only upwards and downwards, does not fulfil the indications.

The phrase "centre of motion of the foot," deserves a little explanation. If you stand upon one foot, and raise the other from the floor sufficiently to suspend it from the hip, rotating it slowly inwards and outwards, both heel and toe describe arcs of circles, of different diameters. Now, while the foot is rotated outward, pass an imaginary line bisecting it longitudinally, and when inward, pass another imaginary line bisecting it, and the point of intersection of those two bisecting lines is the centre of motion of the foot (Fig. 2); a line passing through this point and the hip-joint, being the line of direction of the leg, so that the centre of motion is the proper point to place a pivot,

Fig. 2.

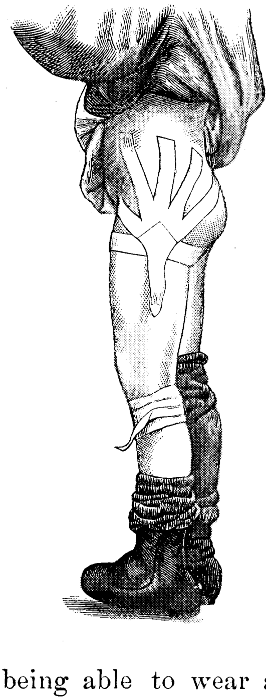


if you wish lateral or rotary motion of a foot in the highest degree, with no opposition; and, therefore, the pivot of our brace is placed in that position.

INVERTED FEET.

This affection is an exceedingly common one among children who are usually designated as pigeon-toed, and causes an extremely awkward gait. It is due to a weakened condition of the peronei muscles, which possess the power of everting the foot, and may be either congenital or non-congenital, the former being much the more common and difficult to treat. In its more advanced stages it constitutes the various types of talipes varus. In simple uncomplicated inverted feet, the deformity is

Fig. 3.



slight, the patient being able to wear an ordinary shoe, the weight of the body keeping it in shape, but the toes point inward and downward, both at rest and in motion.

While the impaired muscles are being treated by electricity, friction, etc., to restore their tone, it becomes necessary for us to use a mechanical appliance to restore the balance of power, to

diminish the extra contractility of the antagonistic muscles, to keep the foot at its natural angle with the legs, and to evert it. This is done by adding to the brace just described under the head of weak ankle, an adjustable elastic cord extending from the outside of the shoe, opposite the little toe, to the instep strip of the brace. It thus everts the foot to any desired degree, depending upon the length and strength of the elastic, provided that the pivot is situated in the centre of motion of the foot, and that the girth about the leg be so fixed that it cannot rotate.

It is accomplished in one of three methods: 1st. The girth may be broad, and furnished with elastic straps, which grasp the limb firmly. This is sufficient in a great majority of cases. Or, 2d. The side strip is provided with an oblong pelvic band, with joints at the knee and hip. Or, 3d. By making two fixed points on the limb by means of strong moleskin adhesive plaster. One of these is to be fixed upon the thigh, and the other upon the leg. (Fig. 3.)

The thigh attachment is made as follows: A square piece of the adhesive plaster is cut in the shape shown in Fig. 4, and to the centre is sewn a perforated leather tongue which is to pass through a buckle on the thigh girth of the brace. The object of this thigh attachment is to make it impossible to adduct the foot when the brace is worn.

The object of the leg attachment is to prevent the girth from slipping around, as when this occurs, the action of the everting

Fig. 4.

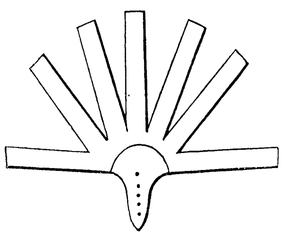
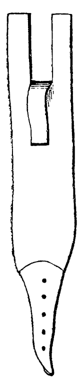


Fig. 5.



cord is destroyed. A piece of adhesive plaster is cut in the shape shown in Fig. 5, and a leather tongue attached to the

pointed extremity, after being fastened to the leg. When the brace is applied, this tongue passes into the buckle of the girth, together with the tongue of the girth, effectually preventing rotation, as the one buckle holds two tongues, one fastened to the leg, and the other to the girth, and each pulling in a contrary direction. These two immovable adhesive attachments afford us the fixed points we require in obstinate cases, and allow us to use a constant elastic power to relieve the super-contraction of the opposing muscles, while relieving the over-distended ones to which the deformity is mainly due, giving us the opportunity to restore these by physiological treatment.

The photographs I now exhibit were taken yesterday, and show the effect of the braces in a well-marked case, in which the feet were also somewhat deformed from too much walking while not in correct position. The child is about three years old, and has had frequent falls, and kept getting worse. The case, when

Fig. 6.

it came into my hands, about two months since, being really a varus, into which the simple condition of inverted feet often glides. (Fig. 6.)

Four weeks of the brace has produced a perfect cure of the condition, it only having been necessary for me, from time to time, to adjust the length and strength of the elastic cords, and

stimulate the weakened peronei muscles by friction and electricity.

TALIPES EQUINUS.

When the insufficiency of the anterior muscles is associated with contraction of their antagonists, we have induced the condition known as talipes equinus.

When not complicated by structural changes among the bones of the foot itself, this may be reduced by the brace just described, with the addition of two elastic cords passing from a point in the side strip near the girth to points on the sole opposite the bases of the great and little toes, of sufficient strength. (Figs. 7, 8.)

Fig. 7.

Fig. 8.

But when associated with structural changes among the bones of the foot, so that the foot cannot be restored to its normal shape without operative or mechanical interference, I would suggest a fixed instead of an elastic power be used to effect the gradual reduction. This can be done by means of an adjustable bracket of the form shown fixed to the foot and leg by immovable attachments. (Figs. 9 and 10.)

I devised this bracket several years ago for a contraction of the arm at the elbow, which it succeeded in extending by gradual adjustment, and it is with great confidence that I urge its claims here as being mechanically adapted for the treatment of the condition described.

Fig. 9.

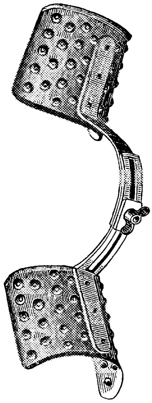
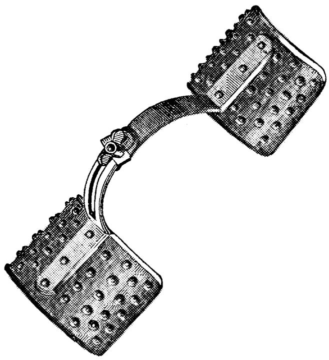


Fig. 10.



Our first aim must be to restore the proper lines of the foot as a whole, by reducing it to its proper position as near as can be, without tenotomy, if possible, and then fixing it in this position by some firm inflexible dressing as plaster of Paris, or the adhesive plaster and flour paste dressing. This must also be applied to the leg.

The bracket is applied as follows, when used with the adhesive plaster and flour paste dressing. (Figs. 11 and 12.)

Fig. 11.

Fig. 12.

The foot and leg are to be sheathed longitudinally by strips of strong moleskin adhesive plaster placed about $\frac{1}{4}$ inch apart

and encircled by other strips, the ankle-joints and vicinity being uncovered. The clamps of the bracket are then loosened, and it is adjusted upon the foot and leg, the terminal plates being bound down firmly by broad bands of adhesive plaster of sufficient length.

A little flour and cold water are now mixed together to a creamy consistence and smeared over the nap of the adhesive plaster, and rollers of unbleached muslin applied, the smearing still being continued until several thicknesses of the bandage are in place.

When this dries, which will be after a short interval, we have a firm, well-fitting attachment which suffers no subsequent expansion or contraction, as does plaster of Paris, and holds the bracket in just the desired position.

At the next visit the surgeon is to flex the foot strongly, the clamps of the bracket being loosened, and when a desired amount of the contraction has been overcome, the clamps are to be tightened, and at that angle the foot will remain until his next attempt.

This can be repeated as often as necessary, until the contracted muscles are gradually stretched to nearly their normal calibre, when the elastic brace already described may be used until the cure is entirely perfected.

This method of treatment substitutes a gradual reduction of the deformity for the quick reduction by operation, and although it takes longer to produce the desired effect than it does by tenotomy, is in many cases advisable, since the objection of the laity to the knife is very great, in fact, among the laboring classes, there is a superstition that one whose heel tendon is cut, whether by accident or operation, does not survive many years.

TALIPES VARUS.

This is an exaggeration of the condition already described under the head of inverted feet, and in it, the medio-tarsal joint referred to under the head of Talipes Equinus, plays a very important part, since the tendons of all the muscles of the leg not connected with the tendo Achillis are inserted anterior to it.

In well-marked cases, especially when of the equino-varus—which is much the more common form—the foot is bent sharply in the middle, and the limb is "twisted" (Barwell) laterally, the

sole looking backwards, the patient almost walking upon the outer malleolus.

The mechanical treatment is founded upon the idea of aiding and restoring the normal relations of the foot in its different parts, and the balance of power in the muscles of the leg.

Any foot that is not so distorted but that it can be brought into its normal shape and relations by the hand of the surgeon by bandaging, whether flexible, adhesive, or immovable, by the use of my bracket and fixed dressing, by any extension shoe, or by tenotomy, or so nearly so that it can be inserted into an ordinary shoe, can be cured by the attachment of my club-foot brace to such a shoe, for it combines in itself the essential principles of the most effective methods of treatment.

Let us look for a moment at the construction of an ordinary shoe, such as we buy at any shoe shop. It is built on a wooden model of the normal foot, and is of great strength and flexibility. Let us look for a moment at the sole of such a shoe. Grasp the toe with one hand and the heel with the other and twist it. It will be seen that the twisting takes place anterior to the situation of the medio-tarsal joint, and that this part of the shoe is very flexible and yet very elastic; that when you let it go, it will resume its previous shape. If you now put a club-foot in such a shoe, although the shoe is correct in shape, it immediately becomes distorted, because the power of the contraction which the foot has undergone is greater than the inherent power of the shoe to retain its shape.

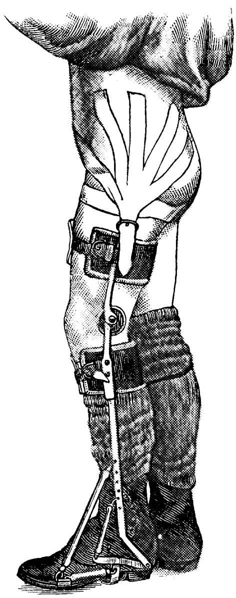
But if you supply the place of the weakened muscles by elastic cords of sufficient strength to overcome the extra contraction of the antagonistic muscles and attach these appropriately to the shoe, the sole is converted into a powerful elastic spring, which is at the same time a firm support.

Let us, for a moment, glance at the Sayre club-foot shoe. It has a rigid sole, divided transversely opposite the medio-tarsal joint, and connected by a ball-and-socket joint which admits of the greatest mobility in every direction. It is not physiological, although more correct than any form of shoe that had preceded it, for there is nothing in this part of the foot to correspond to such a joint, the limited articulations of the foot allowing very little motion in the arch, although much more motion anterior to this. In fact, it will be noticed that the degree of movement allowed by the sole of the foot corresponds very closely to that

allowed by the leather sole of the shoe, which can be twisted by the hands to correspond to the sole of the foot in the worst cases of club-foot—if the upper part of the shoe be divided from the toe to the ankle—and since the sole of the foot is continuous and not split across, although twisted in club-foot, it naturally follows, that the surface to lie against it should possess the same qualifications, if we wish most perfect ease and reduction.

And yet the Sayre ball-and-socket shoe is far superior to the Scarpa shoe. The great advantage of the leather continuous sole in my appliance is, that if it be properly controlled by elastic cords, corresponding to the weakened muscles, and fastened firmly and evenly on the foot, as it must be if encased in a well-fitting shoe, as this is not elastic, it will exert a constant spring action, which is both a support and an agent of reduction, exactly in proportion to the amount of contractive deformity of the foot,

Fig. 13.



and yet as it is continuous with all the twists and sinuosities of the foot, does not impinge or cause discomfort or produce undue pressure on any particular part. It combines the merit of the continuous soles of the various shoes, without their demerit of

rigidity, with sufficient flexibility of the anterior portion of the Sayre shoe compared with the posterior, without its extreme and unphysiological mobility. No club-foot *shoe* is useful without the ball-and-socket joint, but in the club-foot *brace* we are enabled to dispense with this as well, and have more physiological control over the foot itself. (Fig. 13.)

In a previous description of the rigid part of the brace, we have seen that it has but one *fixed* attachment to the leg below the knee, and that by a girth about the upper part of the calf of the leg, corresponding to the origin of the muscles, and one *movable* attachment by a pivot in the centre of motion of the foot; so that beyond protecting the ankle-joint and stiffening the shoe from the heel to the medio-tarsal joint, by the arch plate to which is attached the pivot, these fastenings possess no regulating power over the foot in the least, except when the shoe is attached to the brace by rubber cords.

Now let us look at the uses of the three elastic cords attached to the club-foot brace.

1. The cord passing from the extremity of the horizontal strip to the angle of divergence in the vertical strip, controls the extension of the foot at the ankle-joint, and acts against extra contraction of the tendo Achillis.

2. The everting cord passing from the instep strip to the toe of the shoe, opposite the base of the little toe, acts in place of the peroneus brevis, having practically its origin in the immovable girth about the calf and its insertion in the sole considerably anterior to the medio-tarsal joint, giving it a tremendous everting power, if the girth be fixed immovably as already detailed.

3. The abducting and rotating cord passes from the base of the little toe to a point in the brace near the girth, supplying the place of the peroneus longus, and acting against the anterior and posterior tibial muscles, whose contraction causes the deformity, and as it is inserted at a point in the sole which is really the apex of the deformity, a power is exerted in exact proportion to the length and strength of the elastic tubing, twisting the anterior half of the foot directly contrary to the tendencies of the contraction.

My elastic brace is really a combination of the essential principles of the various club-foot shoes with the essential

principles of Barwell's system of elastic muscles. It possesses the very great advantage over Barwell's system of instant removability, being taken off and put on at pleasure, and furnishing at the same time, which Barwell's does not, an articulated firm support on the outside of the leg, preventing the ankle from turning. It allows the patient to wear a close-fitting, easy shoe, as in a normal foot, and has no constriction or encirclement of the limb or foot, other than the shoe, below the girth about the calf, allowing all the natural movements of the foot full play, simply assisting nature's efforts to guide these in their proper direction. It is light, inexpensive, and lasting, and may be readily attached to any shoe.

The weight of the body is the most powerful agent for good or bad which we have in the treatment of club-foot, and the most important factor, also, in its production. If the relations of the foot are wrong, the weight of the body tends to increase the deformity, but if, by an elastic retentive apparatus, we can put the foot into its normal relations, the weight of the body tends to press out the angularities, and keep it in proper shape, by a power just in proportion to the weight of the person and the amount of walking and running that is done.

This is one of the best features of my elastic brace, that it not only allows, but actually assists the walking, and consequently is a powerful agent for permanent cure.

Now, if the lateral twist of the foot at the medio-tarsal articulation be so great and so unyielding that it cannot be placed in an ordinary shoe or conform to the shape into which the sole can be twisted, it must be treated by either operative or mechanical means until it can do so, when it is to be placed in the elastic brace until the cure is complete.

The mechanical treatment consists in restoring the relations of the foot, whether by the hand of the surgeon, by bandaging, by massage and general manipulation, and the retention between such applications in some fixed dressing as the flour adhesive, or plaster of Paris, applied and allowed to set while the foot is being held in, as nearly as possible, its normal position. It also consists in restoring the balance of power in the leg by reducing the extra contraction with the adjustable bracket before described. Cutting the tendons may be resorted to when desired, but it seems to me that the use of this bracket will, by the sub-

stitution of a gradual for an operative procedure, diminish the frequency of the operation, with its attendant evils.

This chapter may also be considered as a guide to principles governing the treatment of talipes valgus, and the only difference consists in the arrangement of the elastic cords, to be detailed more fully hereafter.

SPINAL EXTENSION; ITS MODES, MEANS, AND MOTIVES.

By BENJAMIN LEE, M.D., PH.D., F.A.A.M.,

PENNSYLVANIA.

EXTENSION of the spinal column, like most brilliant modern discoveries in medicine and surgery, is at least as old as the "Old Man of Cos." Mechanical therapeutics, which, under the paralyzing influence of the mysticism of the middle ages—an influence from which the profession is still struggling to emancipate itself—was consigned to an inferior and most degraded position, was indeed highly prized by his acute and profound intellect. Not only as a means for treating affections themselves mechanical in their nature, such as the various deformities, but as an agent for the relief of manifold disorders dependent upon or accompanied by blood-stasis and exudations, he assigns to mechanical therapeusis the very highest rank as a method of medicine, both on scientific and on experimental grounds. The modes in which spinal extension may be practised are three: Vertical, Inclined, and Horizontal. The means for carrying out these different modes, which have been or are still in use, I will briefly glance at under the same heads.

First, *Vertical Extension.*—The earliest apparatus which we find noticed for this purpose is described by Hippocrates in treating of succussion as a means of rectifying spinal curvatures. It made use of the weight of the body as an extending force with the superaddition of a powerful momentum. It was certainly a heroic mode of treatment. His advice was that when the disease was situated high up in the spine succussion should be performed with the feet downwards, in order to secure a greater extending weight; but when in the lower part of the column with the head down, for the same reason. He describes the mode of attaching the patient to the ladder with a minuteness of detail, which shows him to have had practical acquaint-

ance with the method I call your attention to this plate illustrating the process, not simply as a matter of historical curiosity, but with a view to relieving the apprehensions of those who hesitate to adopt the gentler modes of extension which I advocate.

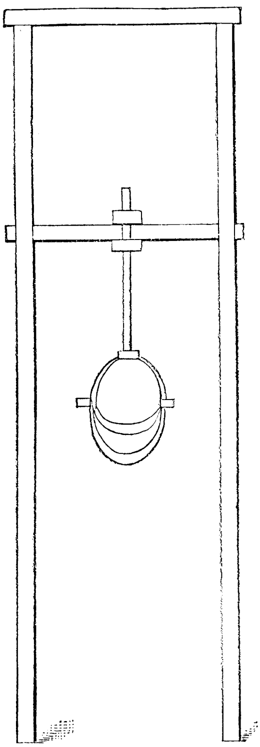
You notice that the apparatus consists of an ordinary ladder somewhat longer than the patient. Hippocrates directs that it should "be padded with leather or linen cushions, laid across, and well secured to one another, to a somewhat greater extent, both in length and breadth than the body will occupy." The patient is then to be laid on the ladder upon his back, and the feet at the ankles are to be fastened at no great distancé from one another to the ladder. He is to be similarly secured above and below the knees and at the nates. The arms, as you see, are strapped to the body. "When you have arranged matters thus," he says, "you must hoist up the ladder either to a high tower or to the gable end of a house." When raised to the requisite height it was allowed to come down by the run, a firm piece of ground being carefully selected to receive it. It is pretty clear that "something must give" in the due performance of this operation, which, however, nothwithstanding its apparent danger, continued to be practised until the middle of the sixteenth century. It certainly afforded convincing evidence of the wonderful strength of the spinal ligaments.

Less violent methods of vertical extension were later employed. Among these perhaps that best worth noticing is the "spine elongator," of Mr. R. E. Stafford, of London, author of "Two Essays on Diseases of the Spine." He says in treating of lateral curvature: "Lateral exercise, however, will not always recover a lateral curvature. The spine is sometimes so completely distorted, and the vertebral column so entirely thrown out of the centre of gravity that the muscles have lost their power. They are so stretched on the convex, and so contracted on the concave side of the curve that they cannot act. In such cases lateral exercise will not alone be sufficient. More must be done. The spine itself must be elongated; and the best method of accomplishing this is by gravitation of the body. To effect this object I have invented a machine by which the patient can be raised up from the ground by the upper part of the body, while the lower part hangs suspended. Hence the lower part, by its own gravitation and by additional weights being hung around the

hips, gradually elongates the spinal column until it becomes nearly if not quite, for the time being, straight." Mr. Stafford's essays were published in 1844.

Mr. John Shaw made use of weights and pulleys to draw the head and shoulders upward, the patient being in the sitting posture. Prof. J. K. Mitchell of the Jefferson School in Philadelphia and a physician of New York, whose name at this moment escapes me, both used extension with flattering results, the former especially in the shape of a contrivance known as the spine car, which united the advantages of locomotion with those of extension, and which is now seen in its perfected form in my improvement of Darrach's wheel crutch with elastic head sling. Mitchell's simple suspension apparatus is shown in Fig. 1.

Fig. 1.

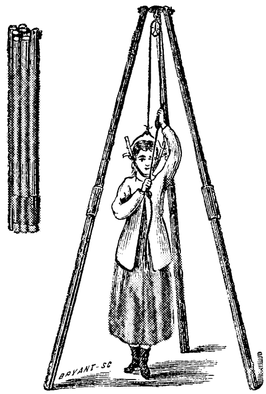


Mitchell's Spinal Suspensor.

My own experiments in vertical extension date back about fifteen years, when Dr. Weir Mitchell, of Philadelphia, kindly called my

attention to his father's mode of using it, and the gratifying success which had attended its employment in his hands. They resulted in what I believe to be the very important modification of self-suspension, which by placing the extending force in the patient's own hands, robs the operation of all its terrors, converting it, in fact, into a pleasant amusement. My instrument-maker, Mr. Spellerberg, of Philadelphia, has, as you see, by means of a folding tripod brought the entire affair within very reasonable limits for transportation (Fig. 2). The tripod, how-

Fig. 2.



Spinal swing with folding tripod. The tripod folded is seen on the left.

ever, is not an essential feature, as the hook can be screwed up in a very few moments over a door-way or to a joist in the ceiling. You observe the mode of application. The patient taking hold of these ovoid handles makes traction downwards on the cord. As this cord passes over a pulley, and is attached by its other end to the patient's head by means of chin and occipital straps, the force which he exerts draws the head upwards, slowly unbending the curves of the spine and relieving the diseased vertebræ, if it be a case of caries, from superincumbent weight. If it be a case of lateral curvature, the patient grasps the higher handle with the hand corresponding to the depressed shoulder. The exercise is rarely painful. It is oftener necessary to check than to encourage the patient in its use.

Secondly, *Inclined Extension* has, however, found more general favor, especially in England, than vertical.

Among the means for its employment, I notice Verral's Prone Couch, Shaw's Inclined Plane, Sheldrake's Inclined Bed, and

Harrison's Spinal Couch. These apparatus, as you see by the plates to which I now point, all have the common feature of making use of the weight of the limbs and lower part of the trunk as an extending force, which, owing to the partial recumbency of the patient, can be exerted through long periods of time; and, therefore, as was claimed by its advocates, will accomplish more satisfactory results than the more powerful traction of vertical extension, which can be tolerated for but a comparatively short time. One of its most useful forms, in lateral curvature, is a modification of Lonsdale's couch, in which the patient's trunk is supported by a broad band passing under the projecting shoulder, while the limbs rest upon a counterpoised, hinged support, which not only affords an opportunity for using their weight as an extending force, but also for active exercise of the muscles of the spine and of the sides of the trunk.

Thirdly, *Horizontal Extension* has had many advocates. Hippocrates describes its mode of application minutely. Paré, whose work on surgery was translated into English as early as 1665, quotes extensively from the former, and adopts his method in this operation. It was performed, as will be seen in this plate, by manual force, a bandage being carried around the chest, under the axillæ, and another around the hips, and traction being made on these, at either end of the table by a stout attendant, while the physician himself made pressure downward upon the projecting vertebræ. Paré says that, "Unless extension be made, restitution is not to be hoped for."

Among the more recent apparatus for this purpose, I instance Darwin's Bed, Delpech's Couch, and Cole's Orthopædic Sofa, which are represented in these diagrams. In all of these, traction is made simultaneously upon the head or arms or both in one direction, and upon the hips in the reverse direction, the force being either in the shape of a screw or of a windlass.

The most perfect piece of mechanism ever constructed, however, for the purpose of producing horizontal extension of the spine, is that to which I now have the pleasure of calling your attention. It is the product of the inventive brain of Mr. W. H. Johnstone, of Philadelphia, the manufacturer of the Adaptable Porous Spinal Jacket, and was devised by him, at my suggestion, for the purpose of taking the plaster cast, in order to obtain a counterpart of the patient's body in a state of extension, with a view to moulding the felt jacket upon it. It consists of a strong

frame about seven feet in length, three in width, and four in height, made to separate across the middle. By turning this wheel crank at the side, the two sections are caused to move in opposite directions at an equal rate of speed, and with extreme steadiness and precision. It is furnished with head and axilla strings and gaiters for the feet, both of which are made fast by a fine rope to cleats at the head and foot of the frame. On either side, at the point of separation, is inserted a metallic measure, graduated to the sixteenth of an inch, by which the amount of extension is accurately indicated, and by means of which a record of progress can be kept from day to day. The bed upon which the patient lies consists of a series of movable narrow, transverse cushions, which rest upon a shoulder inside the frame. The lower portion of the frame is divided into inches along this shoulder, the two sides being numbered exactly to correspond.

The upper section of the table is surmounted by a four-post canopy, which carries a belt, upon which, under certain circumstances, to which allusion will be made later, the body of the patient is supported, the head at the same time resting upon a similar adjustable belt at the upper end of the couch. The ease with which extension of the spinal column can thus be produced, the extreme delicacy as well as tremendous power of the extending force, and its self-registering capacity, combine to render this apparatus what the French call an "instrument of precision." And it must be confessed that the operation is performed with the least possible discomfort to the patient. The entire absence of all jerk or jar in its action enables extension to be made, to a very considerable degree, almost without his consciousness.

Having thus briefly indicated some of the more important of the means at our disposal for practising the various modes of spinal extension, it remains for me to speak of the motives with which this operation is performed. Its objects are twofold: First, direct or immediate; Second, indirect or mediate.

Its direct object is the overcoming of muscular and ligamentous contraction, with a view, first, of reducing fractures or dislocations of the vertebræ; secondly, of overcoming spinal curvatures and deformities; and, thirdly, by frequent repetition, of enabling the muscles of the spine at length to maintain it in a position of normal rectitude. For the first-mentioned purpose, namely, the reduction of fractures and dislocations of the ver-

tebræ, "Johnstone's Extension" or, as he prefers to call it, "Surgical Table," is certainly most admirably adapted. The difficulty is, that such cases are usually of an extremely critical nature, not admitting of delay, and that this apparatus is not likely to be at hand in case of accident. If, however, every large hospital were provided with one, it might occasionally happen that a case would be brought in, demanding its use, which could be saved in no other way. I cannot urge too strongly the importance of the immediate and persistent, and, if need be, heroic employment of extension in every traumatic lesion of the spine of a paralyzing character. The cases are fast multiplying in our journals in which it has been used with the happiest effects in both dislocations and fractures. Either suspension or horizontal extension may be employed. The plan of Hippocrates, which you see represented in the plate to which I point, by means of traction on fillets around the chest and loins, by two assistants, while the surgeon himself endeavors to press the parts into their normal relations, will often prove entirely successful, and the means for it will generally be at hand. Where the almost inevitable conditions, in the event of the failure to give relief, are those of a horrible, lingering death, continuing it may be through weary months of agony, surely the surgeon is justified in assuming any risk. But, fortunately, the risk is not nearly so great as is usually imagined. Hippocrates shows us what we may safely venture to do.

When, however, the correction of deformity by means of daily repeated extension is the desired end, self-suspension by means of the spinal swing must suggest itself as the superior method, from the fact that the muscles of the spine are thus brought into voluntary action, and stimulated to increased development and tone. There is besides a degree of freedom and variety of movement in the latter which render its daily employment less irksome to the patient than the close restraint of the couch and the entirely passive character of its movement.

The indirect or mediate object of spinal extension is the overcoming or redressing of a curvature and the concomitant deformity of the trunk for a brief space of time, during which a fixed dressing can be applied, or a cast taken from which a removable jacket can be made. With the former of these plans, namely, the application of the plaster-of-Paris jacket, the name of our distinguished president is associated the world over, and

will be indissolubly connected as long as medical science shall continue to bless humanity. In a paper which I had the honor to read before the Medical Society of the State of Pennsylvania, a year ago, on the subject of "Horizontal Extension for the purpose of applying the Porous Felt Jacket for Curvatures of the Spine," I gave my reasons for considering that this mode was preferable to vertical extension or suspension for the purpose of taking a cast or applying a jacket. These were, briefly, diminution of pain inflicted upon the patient, and hence diminution of anxiety and of necessity for haste on the part of the operator, and greater ease of manipulation. The plan which I adopted was to saturate short strips of crinoline with liquid plaster, lay them in order upon the extending couch in two or three layers, transversely, place the patient upon them and double them over the trunk after the manner of the bandage of Scultetus.

The table before me dispenses with the bandage altogether, in taking a cast for merely temporary purposes. It is provided, as you see, with a large pan, which sets into the upper part of the frame, and in which two smaller pans, open at both ends, are laid. These smaller pans can be telescoped, one inside the other, and thus adapted to the length of the trunk. The process of taking the plaster cast with this table is as follows: The patient, having been first thoroughly greased over the entire body, is laid upon his face upon the table, the plaster troughs or pans being in position. He rests with his forehead supported by one broad strap, and his trunk by a second, while the legs lie upon so many of the movable couch pieces below, as it is found convenient to leave in position. The head and feet being then properly secured, gradual extension is made. When it has reached such a point that the patient becomes conscious of pain in the back, it is to be very slightly relaxed. The chest band is now to be removed, and the forehead band placed at such a height that the most dependent part of the chest shall lack about a fourth of an inch of touching the bottom of the plaster pan. The movable inner pans are now adjusted to the length of the trunk, and their open ends are quickly filled up with moist plastic clay, fitting accurately to the body. Plaster of the consistence of cream is now poured into the pan, and a fine cord or soft wire is laid along each side of the patient, close to the skin, from the axilla to the trochanter, for the purpose of cutting the cast. This done, the patient's back and sides are quickly coated with a thick plaster

solution, until he is firmly incased in a shell of about three-fourths of an inch in thickness. The wires will now be ready to be drawn. This must be done carefully, drawing directly outward from each end with steady force. The upper section of the cast is then gently removed, the lower section remaining in the pans, until the patient is lifted off. He should be raised out of it by elevating the forehead strap before relaxing the extension, in order not to injure the fine surface of the cast. The two segments can be cemented together with a little liquid plaster, at leisure, and the cast is then complete. Inside of this form is cast a plaster mould, which is of course a complete reproduction of the trunk of the patient; and on this mould the felt, in a state of the utmost plasticity, is accurately stretched, being adapted to every minute inequality of the surface. A jacket is thus obtained which is as perfect in fit as the plaster, but which is pervious to the air, and removable at pleasure for purposes of cleanliness.

I may be pardoned for calling your attention, in conclusion, to the fact that spinal extension is, however, only one of several important uses to which such a table can be put. Its applicability to the reduction of fractures of the lower extremities, of dislocations, and even to the performance of operations in which immobility of the limb is a prime desideratum, needs only to be mentioned to be appreciated. The movable and sectional character of the bed enables us to get at any part of a limb without subjecting the patient to the pain of lifting it, while at the same time it is held much more firmly than could be done by an assistant. For irrigation and drainage, it will afford marked facilities.

It has also features which make it very serviceable as a convalescent bed, of after operations or accidents, or for the hopelessly bedridden, in the way of mechanism for altering the position of the body, with great ease and comfort to the patient for the purpose of defecation and for maintaining cleanliness. In a large hospital I am confident that it would be called into almost daily requisition.

SURGICAL TREATMENT OF NASO-PHARYNGEAL CATARRH.

By D. H. GOODWILLIE, M.D., D.D.S.,

NEW YORK.

Of the etiology of naso-pharyngeal catarrh, I desire only to say in reference to those cases that shall occupy our attention at this time, that their history, in many instances, commences in early life, even in infancy. Particularly is this the case in deviations and exostosis of the nasal septum.

The sides of each nasal fossa contain the three turbinated bones, and throw the mucous membrane that covers them into folds, so that in a small space a large amount of mucous surface is exposed—a wise provision for tempering and cleansing the air that passes over it to the lungs. Experiments have shown that air respired through the nose is raised in temperature two degrees higher than that respired by the mouth.

Respired air must pass through *both* the nostrils *alike* to produce a healthy respiration.

In the same proportion that respiration is prevented through the nose, the gateway to the lungs, will there be catarrhal conditions of the upper air passages, and in many cases reaching the lungs ultimately.

Of the passages through the nostrils the inferior meatus is the most important, as it is the chief respiratory passage for air and for the carrying off, in a great measure, the nasal secretions. For the latter purpose it is lined with ciliated columna epithelium. The mucous membrane is quite vascular, and consequently subject to very sudden engorgement.

I do not propose to say anything respecting catarrhal conditions that require *medical treatment only*, but shall speak of such cases as have passed that point, and can only be relieved by surgical interference.

Some of the pathological conditions requiring surgical treat-

ment, to which I desire at this time to call attention, are the following, viz.:—

1. *Exostosis.* 2. *Deviated nasal septum.* 3. *Hypertrophy of the erectile cavernous tissue on the turbinated bones.* 4. *Polypi.* 5. *Necrosis from struma or syphilis.* 6. *Chronic antrum disease.* 7. *Chronic maxillary abscess from tooth disease.*

The time allotted me will only suffice for the consideration of some of these, which I will endeavor to illustrate by a few cases and by means of diagrams and wax models.

Exostosis of the turbinated bones is not so frequent as are exostoses in the vomer when associated with deviated septum. Such growths are attended usually by pains of a neuralgic character; they prevent respiration, and by pressure cause sloughing and necrosis of adjacent parts.

Exostosis with deviations of the septum is of more common occurrence. Wherever the vomer takes a sharp deflection there is often found an exostosis on the convex side just at the greatest part of the curve. When this occurs along the line and into the inferior meatus, as it more often does, it gives a great deal of catarrhal trouble by preventing free respiration and the passage outward of the nasal secretions, which not being changed by a free respiration become fetid by decomposition.

Deviations of cartilaginous septum are quite numerous—curves in between the bony septum and the columna in many directions. Dislocation of the lower end of the septum with displacement of the nasal spine also produces abnormal respiration.

Hypertrophy of the erectile cavernous tissue covering the inferior turbinated bones.—Some years ago Dr. Henry J. Bigelow, of Boston, in an article in the *Boston Medical and Surgical Journal* for April 29, 1875, stated that he had found "a remarkable and well-formed cavernous structure at least upon the middle and inferior turbinated bones. The difference in size of the distended and collapsed cavernous bodies is quite striking, and is best seen upon the inferior turbinated. Collapsed, the outline and dimensions are nearly those of its attenuated bony framework. Distended, it becomes an angry, turgid mass of uneven surface and livid color, completely closing the lower nostril. A pouch-like dilatation projects from the rear of the bone, increasing its length, and, with the aid of a blowpipe, readily showing on section to the naked eye cavernous cells. It is this reticulated pouch that is seen with the mirror at the back

of the nares. Above is seen the middle turbinated mass similarly distended, and if the injection of the whole membrane is considerable, the nasal septum also swells to nearly the thickness of one-quarter of an inch. If inflated and dried, the cells project upon the surface. A section gives further evidence of a cavernous structure with closely juxtaposed cavities tolerably uniform in size and equally distributed, approaching quite nearly both the mucous surface and the bone. They communicate by irregular apertures while minute bands or septa traverse and connect their common walls.

"A wet microscopic section exhibits thin trabeculæ and walls, composed mainly of connective tissue, presenting cavities of unequal dimensions, and closely resembling the cavernous structure of the penis; although the smooth muscular elements, as also the tunica albuginea of the latter, are somewhat more pronounced, as might be anticipated from the comparative erectile tension of this organ."

I pass around for your inspection two wax models of cleft palates, showing the extensive hypertrophy of the tissues covering these bones. When fully erected, they entirely fill up the cleft. In one will be observed this condition, while in the other there is a state of non-erection.

By experiment made on them, I found that anything that would excite the salivary and muciparous glands to increased action caused an erection of this hypertrophied erectile tissue. When the exciting cause was removed, after a short time it receded.

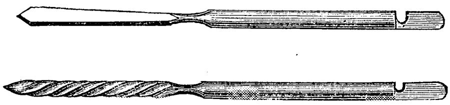
This erection and collapse is a physiological fact in the normal condition, and is intended to purify the tidal air passing in respiration from all impurities, and so protect the pulmonary organs against disease. The hairs in the vestibule of the nostrils and this erectile tissue are *faithful sentinels* to arrest impurities in the respired air.

By a constant irritation of this erectile tissue by impurities in the respired air, by a mechanical irritation caused by a constant and forcible blowing of the nose in chronic catarrh, the effect of which is felt on the anterior part of the inferior turbinated bone just within the vestibule, a hyperplasia is thereby set up, which results in so thickening this tissue that normal respiration is very much interfered with, and, in some cases, entirely

prevented. To the above causes may be added, in many cases, a constitutional predisposition to catarrhal diseases.

Treatment of exostosis of the turbinated bones, when large, consists in drilling the enlargement at its base by means of the surgical engine, when it may be removed with the nasal forceps. (See Fig. 1.)

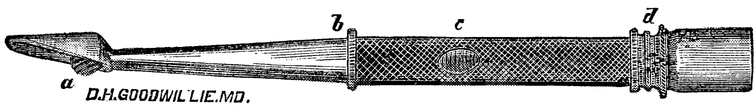
Fig. 1.



Cutting Drills.

The exostosis on the vomer is removed by the revolving multiple knife carried through the nostrils to the pharynx, inclosed within the sheath, so as not to cut any tissue except the exostosis. The small exostoses of the turbinated bones are removed in the same way. (Fig. 2.)

Fig. 2.

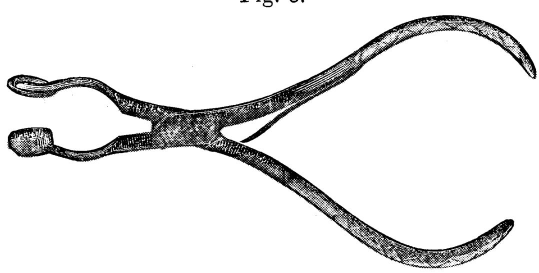


Knife (*a*) within the sheath. Revolving Knives.

For the treatment of the *deviated cartilaginous septum*, I have found no operation so successful as removing a section containing the bend, by means of the excising nasal forceps[1] devised some years ago.

One blade contains the circular or oval knife, and the other is flat, against which the knife comes when it has cut its way through the septum. (Fig. 3.)

Fig. 3.



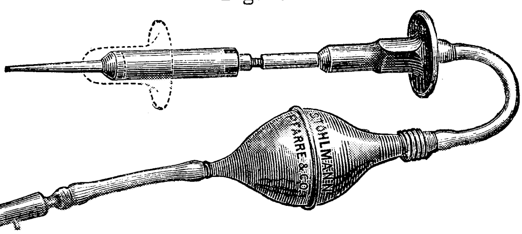
[1] My attention has been called to a somewhat similar instrument described in Dict. Encycloped. des Sciences Méd. et Chirurg., article Nez.

It requires some half a dozen forceps of different sizes and shapes to meet every case.

In dislocation of lower end of cartilaginous septum, make an incision over the end of the dislocated and protruding cartilage down to the cartilage, denude it of the periosteum, push this back and then amputate the protruding cartilage (and nasal spine also if it is displaced), replace the denuded soft tissues and hold them together by small sutures.

The *hypertrophied erectile tissues* on the turbinated bones are removed by means of the galvano- or thermo-cautery. For the Paquelin cautery I have devised a new handle, which is held between the two fingers and thumb. In the office, use the condensed air instead of forcing the air by the hand-balls. The cautery is very efficiently held and the force of the air easily controlled by the thumb. The thermo-cautery can only be used in the anterior nares. (Fig. 4.)

Fig. 4.

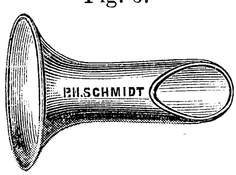


Dotted lines represent the shield through which the cautery passes. The part of the cautery within the shield is covered over with asbestos to protect the vestibule from the heat.

The galvano-cautery is by far the most efficient cautery to be used in the nose. By the use of properly constructed electrodes it can be used anywhere in the nose, pharynx, or larynx.

The vestibule of the nostrils is protected from the heat by a shield made of glass and asbestos. The lower part of the shield is flanged so as to be easily held between the fingers. The top of it embraces the part to be cauterized. The electrode, when heated to a high heat, is passed through the shield on to the parts to be removed. (Fig. 5.)

Fig. 5.



Chronic antrum disease is a frequent source of naso-pharyngeal catarrh. This commences almost always by a decomposed dental pulp opening into and setting up trouble in the antrum. With this there is more or less facial neuralgia. I do not think this

is often recognized, except perhaps in extreme cases where extensive necrosis exists.

The proper treatment is to extract the molar and trephine through the alveolar process into the lower part of the antrum. If the disease has existed for any length of time, the naso-antrum foramen will be enlarged, and occasionally the entire nasal wall and inferior turbinated bone will be necrosed. Successful treatment requires a large opening in the nasal wall, so that it may give free exit to the discharge and allow proper cleansing of the cavity. It must be faithfully dressed by washing it out with thymol or carbolic acid and water.

Chronic maxillary abscess of the second or third molars occasionally discharges into the pharynx and produces catarrhal conditions. Extract the tooth, and open well into the abscess, and keep it open until it granulates from the bottom to the surface.

After all surgical operations the patient is *positively forbidden* to blow the nose for the first twenty-four hours, as a preventive measure against hemorrhage. After that time the nose is freed of clot and mucus by means of the nasal dressing-forceps and the nasal douche. Then the powder of iodoform and camphor is blown in, covering the entire mucous surface of the nose or antrum when that cavity has been opened.

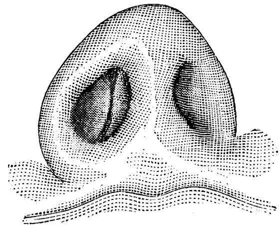
In cases where an anæsthetic is given I always commence with nitrous oxide, and if the operation is to be prolonged, continue with some other anæsthetic. The head of the patient is securely fixed in a head-rest, preventing any motion during the operation.

The following cases were all severely troubled with naso-pharyngeal catarrh. There being stenosis of the nostrils, the discharges were either expectorated or swallowed.

CASE I. *Hypertrophy of erectile tissue of both inferior turbinated bones.*—G. G.—sent to me by Dr. D. Monro, Ontario, Canada—aged 29 years, of Ontario, Canada, single, has had catarrh for many years. Formerly had much blowing of the nose, but now has so much stenosis of anterior nares that the discharges are expectorated; respires through the nose very little; voice, in consequence, quite nasal in tone. Slight curve in the cartilaginous septum to the left. Soft tissue over both inferior turbinated bones hypertrophied; the right one the largest, as it fills up the curve in the septum. Rhinoscopic appearances reveal enlargement of tissues on inferior turbinated bones, and also on

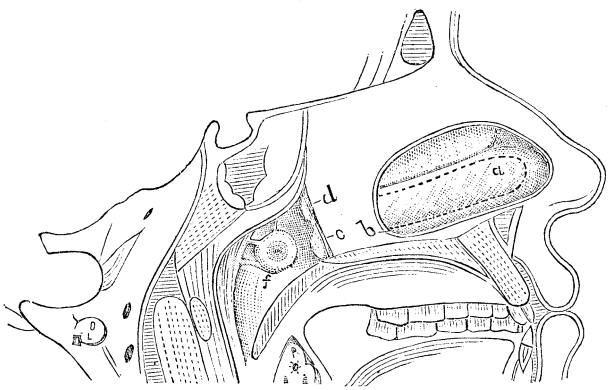
each side of the septum. Inferior meatus nearly filled up by the hypertrophy. Uvula very much hypertrophied and elongated. Slightly deaf in both ears. Pharyngeo-Eustachian opening much enlarged, with two on one and three on the other of fibrous bands attaching it to the pharyngeal folds. (See Figs. 6 and 7.)

Fig. 6.



Hypertrophy of inferior turbinated within the vestibule.

Fig. 7.



a, hypertrophy on inferior turbinated filling the inferior meatus, *b*, and seen also behind the posterior septum at *c*. Dotted lines represent the normal size of inferior turbinated bone. *d* represents an enlargement on the septum. *f*, pharyngeo-Eustachian opening with three fibrous bands.

Treatment.—Amputated uvula. Removed the anterior part of the hypertrophy on inferior turbinated bones by the thermo-cautery, and the posterior part by the galvano-cautery, under anæsthesia produced by nitrous oxide. Cut the adhesions at the Eustachian opening without an anæsthetic. Twenty-four hours after each operation the nostrils were cleaned out by the forceps, the nasal douche cautiously used, and the powder applied. For a short time after the operation this dressing was made twice a day.

Not much benefit in respiration is experienced by the patient

during and for some time after the operation, as the cauterizing excites a free discharge from all the muciparous glands of the nose and pharynx, and in consequence the nostrils are quite stuffy. But as the parts heal and contract, and the air, the natural element, passes over them, there comes a sense of relief. This patient being a large manufacturer, he could only remain under treatment six weeks, but much was accomplished in that time, thanks to the patience of my patient. His respiration was fully restored and voice much improved. Small scabs over the last places cauterized, some nasal secretion, as the small scabs kept up an irritation in the nose, but as they heal the secretion becomes normal.

CASE II. *Loss of singing voice from hypertrophy of erectile tissue on inferior turbinated bones.*—The following letter from the family physician gives the history, diagnosis, and the result of treatment in the next case—that of a prominent singer:—

NEW YORK, May 28, 1880.

TO D. H. GOODWILLIE, M.D.

MY DEAR DOCTOR: On the 26th of October, 1879, I sent you for treatment Mrs. A. B., æt. 26. The following is the history of the case: The patient was one of our best contralto singers; when suddenly she noticed a difficulty in emitting her head notes, and little by little lost her singing voice almost completely. Being the family physician I was consulted, and, after a laryngoscopic and rhinoscopic examination, I was convinced that all the trouble was in the nasal cavities. I found on each side a thickening of the mucous membrane and hypertrophy of the soft tissues over the turbinated bones. The occlusion was nearly complete, leaving very little respiration through the nose. Your diagnosis confirmed mine, and putting the patient in your hands you began the treatment that terminated so successfully. Now I am happy to state that the result was very gratifying to my patient.

After the first operation her voice began to return, and after the last operation she was able to appear in public on April 22, 1880, and sang four times with *encores*.

Receive, my dear doctor, with my congratulations for such a success, the expression of kindest regards.

Yours very truly,

L. DE BREMONT, M.D.

From the shock from the loss of her voice she had become anæmic, and suffered from indigestion, constipation, headaches, and insomnia.

Treatment.—Prohibited the use of wine, tea, or coffee, and recommended milk diet with farinaceous food. The milk to be taken warm, a teacupful at a time, with a very little lime-water. Gave also elix. gentian and tinc. of chloride of iron. The body to be sponged night and morning with salt water and bay rum. Flannel to be worn next the skin, which she had never done before.

The hypertrophy was removed by means of the cautery in three operations under nitrous oxide.

She now looks hale and hearty, no indigestion or constipation, has gained more than twenty pounds in weight, no insomnia, and voice regaining its strength after having lost it for some three years.

(In the wax model of this case you can see, just within the vestibule, the passage nearly closed up. It looks very much like a half of a red cherry. The other model exhibits the nostrils after the operation for its removal.)

CASE III. *Hypertrophy of tissue on infra-turbinated bone, with deviation of cartilagnious septum.*—S. M., of Alabama, sent me by Dr. L. B. Bangs. In early life was troubled with running from the nose, but in adult age the anterior nares became partially closed, then expectoration increased. Went abroad, and in Germany received treatment by cauterizing the enlarged pharyngeal follicles without any benefit. On examination found lungs healthy. A severe naso-pharyngeal catarrh giving him great trouble. Thick mucus running down on each side of the vertebral ridge from the nares. Pharynx granular, with patches of a dry, smooth surface where the follices had suppurated or been destroyed by the cautery. Cartilaginous nasal septum deviated into right nostril, with hypertrophy of soft tissue on both inferior turbinated bones. Very imperfect respiration. Smelling much impaired.

Treatment.—Removed oval section $\frac{1}{2}$ x $\frac{5}{8}$ inch of bend of septum with the excising nasal forceps. This operation opens up right nostril and improves his respiration.

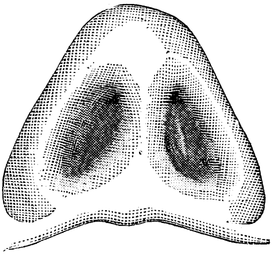
Six months after this first operation, removed small pedunculated polypus from right nostril posterior to the section; also

by the cautery the hypertrophy on left inferior turbinated bone, without an anæsthetic.

Two months after his return home, he writes that his respiration is good, and catarrhal discharge very little and gradually decreasing.

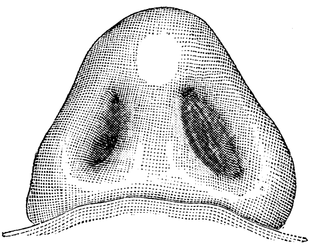
CASE IV. *Deviated septum.*—Dr. Herman Knapp sends me H. E. C., a law student, with the cartilaginous nasal septum deviated into the left nostril, preventing respiration, causing catarrhal trouble, with some defect in his sight. On October 22, 1879, in the presence of Drs. Knapp, Farnham, Robinson, and Bozeman, I removed, with the excising nasal forceps, the bent part of the septum. This restored respiration and gave him great relief. (Figs. 8 and 9.)

Fig. 8.



Before the operation.

Fig. 9.



After the operation.

CASE V. *Dislocation of cartilaginous septum.*[1]—E. G. (referred to me by Dr. C. R. Agnew) has been suffering for many years with catarrh. While it was at first nasal he was in the habit of placing the thumb of the right hand against the right side of his nose when he blew it (the catarrh being in a great measure from the left nostril). Found the septum and nasal spine dislocated into the vestibule of the left nostril and protruding outside, pushing to the right the columna nasi. Respiration was entirely prevented from the left nostril, and not perfect in the right. Has deafness of left ear.

Treatment consisted in making an incision over the protruding end of the septum and spine, denuding the soft parts, pushing them back, and amputating the septum with one of the excising nasal forceps. The soft parts were brought together again, and united by sutures. This restored respiration, the good effect of

[1] Canada Medical Record, December, 1879.

which was seen by great improvement in catarrh and also in the hearing.

CASE VI. *Hypertrophy of erectile tissue and deviation, with exostosis of nasal septum.*—F. P., from Westchester Co., N. Y. Has had nasal catarrh for many years; now air and the mucous discharge do not pass freely out of the anterior nares, in consequence of an enlargement on the inferior turbinated bones and a deviation with exostosis of the septum into the inferior meatus. Has also chronic follicular pharyngitis; he suffers now from post-nasal trouble; snores in his sleep, from imperfect nasal respiration; takes cold readily and has sore throat; hawks and expectorates to relieve himself of the naso-pharyngeal discharge.

Operated under an anæsthetic, and removed hypertrophied erectile tissue with the galvano-cautery. The deviation and exostosis were removed by means of the revolving knives (Fig. 2) and surgical engine. The inferior meatus is now quite free, and he breathes, sleeps, and eats well, or, as he expresses it, has a "wonderful amount of comfort now."

The following gentlemen were present at the operation: Drs. F. N. Otis, J. C. Hutchinson, H. P. Farnham, and E. D. Hudson, Jr.

THORACENTESIS.

THORACENTESIS—THORACOCENTESIS—PARACENTESIS THORACIS—THORACIC ASPIRATION.

By CHARLES A. LEALE, M.D.,

NEW YORK.

Mr. Chairman and Gentlemen: Opening the thorax for the removal of the diseased contents, either within or surrounding the lung tissue, has during the past thirty years attracted universal attention; and, instead of the vain attempts, in certain lung diseases, to promote absorption and cure by bleeding, purging, or giving large doses of medicine, whereby formerly many were allowed to die unrelieved, we now resort to the safe procedure—at least thereby prolonging life, and in some instances causing a complete restoration to health, the lung resuming its former healthful action.

It is said of Phalerius that, being expected to die of an abscess in the lung, declared to be incurable, he went into battle for the purpose of getting killed, but, being only run through the body, recovered, in consequence of the escape of purulent matter through the holes thus made in his chest.[1]

Six years ago, in a paper read before the New York Academy of Medicine, I gave the history of the operation, and fourteen instances where I had observed the effects of opening the thorax.

Six years ago, in a paper read before the New York Academy of Medicine, I quoted authorities, showing the operation of thoracentesis to be one of the oldest in surgery, commencing with Hippocrates, down to 1624, when Jerome Goulu frequently punctured the chest for hydrothorax; 1658, when Bontius considered, in a precise manner, the subject of allowing air to be introduced into the chest; 1841, when Prof. Skoda and Prof. Schu, of the Vienna School of Medicine, published an important

[1] Mr. Guthrie, London Lancet, June, 1853.

work on this subject. In 1844, Prof. Trousseau read his memoir before the French Academy of Medicine. Ambroise Paré has the credit of having been the first to use the trocar and canula for withdrawal of fluid from the thoracic cavity.

Opening the chest for the exit and removal of the diseased contents has become a recognized operation all over the civilized world, and yet we meet with educated physicians who contend strongly against even aiding nature to effect a means of cure. The illustration of the good results following this measure can be attested also by the oldest accounts of surgery in the United States, it being now nearly two hundred and twenty years since Dr. Spöri operated in New England. The new impulse given by Dr. Wyman[1] thirty years ago, who was courageous enough to insist upon the performance of an operation dictated by his accurate knowledge of the disease, its pathology, and the dangers to which his patients were exposed, if not relieved by art, has been often quoted. But to Dr. Henry I. Bowditch, of Boston, a former President of this Association, is the profession greatly indebted. Dr. Bowditch not only strongly advocated thoracentesis, but, in nearly three hundred recorded operations, gave to the profession the results of his vast experience, and taught a method of operating which has given success not surpassed by any other; and probably he has done more by thoracentesis than by all his varied scientific accomplishments to make himself a cosmopolitan reputation, thereby reflecting honor on American scientific medicine. His contributions to surgery are a part of the medical history of the United States.

The opposition to thoracentesis was so great only thirty years ago that, at Dr. Wyman's first operation, all the consultants were afraid of the risk, although without the relief thus promised they knew that death must inevitably follow. Even after the successful demonstration had been shown, the prejudice was so intense that Gerhard, of Philadelphia, said that he would as soon put a bullet through the chest.[2]

The dread of having the cavity containing the lung opened by a delicate and almost painless operation is, in the large proportion of instances, overcome when the accumulated experiences of those thus relieved have been related; and the pleasure

[1] Dr. Chadwick, Boston Med. and Surg. Journ.

[2] Remarks of Dr. Bowditch.

is more than equalled when they themselves see pound after pound of the results of disease removed, the breathing relieved, and thereby one of the most painful modes of death averted.

It is now over fifteen years since I first operated upon a man, painfully gasping in the agony of death, bathed in cold perspiration, and by looks pleading for relief. He had pyo-pneumothorax. I gradually removed more than half a gallon of very offensive matter from his left thorax. This man entirely recovered.

In all, I have performed twenty-one operations, without a single bad result, and feel convinced that life has been saved thereby; in several instances complete restoration to health has followed, while in others one of the most distressing ways of dying has been prevented.

My first operation was on a man whose thorax and lung had been perforated by a bullet, which carried part of his clothing into the lung, as it ploughed through the chest contents. He immediately coughed up large quantities of blood, which nearly choked him, while the profuse internal bleeding within the thorax caused sufficient pressure to prevent an immediately fatal hemorrhage, by compressing the lacerated parts, thus at the same time relieving shock, and giving an opportunity to be carried to a place of safety.

In May, 1865, I was called to his bedside to see him die, and found him sitting up in bed supported by two nurses, gasping agonizingly for breath, bathed in the cold perspiration of death. Not a moment was to be lost, even to send to the office for instruments, so from my pocket-case I took a scalpel and silver catheter, made a valvular incision near the eighth rib, through which liquid escaped, then to the free end of the catheter attached a Davidson's syringe, and by slow suction, sixty-eight ounces of thick, decomposing pus were withdrawn.

The stench of the liquid was so intolerable, that long before the termination several of the attendants became faint and left. To restore the patient, a nurse gave an ounce of iced champagne every two or three minutes. After about a pound had been withdrawn, the action of the heart became more vigorous, and a marked improvement occurred in the breathing as the pressure on the opposite lung was relieved. I withdrew very slowly, as the patient's strength permitted, and before ending, had removed from the chest over half a gallon of this putrid matter,

when the instrument was withdrawn. I closed the valvular opening and hermetically sealed it by collodion.

The operation had not terminated fifteen minutes before he expressed great relief; from that time he steadily improved, and in twenty days after the operation was able to leave for his home. He was then rapidly regaining the use of his lung, could easily walk a mile, and was apparently in a condition for a speedy recovery. In response to a letter from me four years after leaving, he stated that he was enjoying excellent health.

I cannot go over the entire subject of thoracentesis in the brief time allotted to each member, but will answer several of the most important questions in regard to the operation which members of different societies, both in Europe and America, have asked in the medical journals, many of which have never before been answered, and present some of my most important observations during the past fifteen years. Return to health after a single operation frequently occurs.

In March, 1879, I withdrew fifty ounces of serum from the chest of a man aged 47 years, where so much pressure existed that, although sitting up in bed supported by attendants, the intra-thoracic pressure was so great that a fatal result was soon expected.

No unfavorable symptoms immediately resulting from the operation were noticed, and in two weeks, against the advice of his attending physician, he returned to work, and in two months, when examined, it was found no reaccumulation had followed. Serous effusion only to a degree producing dangerous symptoms in consequence of pressure requires removal, and the quantity removed may only be sufficient to relieve the distress, as absorption so rapidly follows as a rule where no injury has been done to the lung, and where the wound has been closed without suppuration or the admission of air into the thorax.

Collections of pus in the thoracic cavity may possibly, under very favorable circumstances, be absorbed, but to evacuate, as a rule, will give better results. I consider it a much safer procedure to open by incision rather than by trocar. First draw up the integument over the centre of the broad surface of the rib, then cut by firm pressure through the tissues external to the bone; then, while leaving the scalpel *in sitû*, follow the retracting skin to the point chosen for penetration, keeping close to the upper border of the rib, to avoid the intercostal

artery, enter the thorax, making the desired incision before the removal of the instrument the desired size. Withdraw, and introduce some smooth, non-irritating tube. I prefer a silver male catheter No. 8, and either allow the matter to flow out or withdraw by suction, having the curved end of the catheter pass downward and kept at the most dependent part of the chest near the diaphragm. The operation by this method can be accomplished without the admission of air, and, after the desired quantity has been removed, it is better to close the wound to have the remaining small quantity absorb, or to operate again, rather than leaving an unguarded opening to induce septic poisoning over such an extensive surface as the lining membrane of the thorax.

Atmospheric air, pus, and blood, after thus closing the wound, I have known to disappear, and the compressed lung and diseased pleural membranes again resume their normal condition.

Rapid absorption of an extensive serous effusion after the withdrawal of only a sufficient quantity to relieve the intense inter-thoracic pressure, which threatened immediate death.

J., aged 19 years, a market man, residing with his parents, while exposed to a snow-storm had a severe chill, followed by great fever lasting for nearly a week, during which time he was treated at home by his mother. When I first was called to see him I found shortness of breath; he was unable to lie down, the rotundity of the thorax on the affected side was very much increased, and the evidences and symptoms of the inter-thoracic pressure were great, causing displacement of the heart and opposite lung.

I withdrew a very small quantity, not more than one ounce, of clear, greenish serum, which coagulated on cooling, and said that I would return to complete the operation. But when I again saw him the dangerous symptoms were so far relieved that it was deemed unnecessary to operate. He continued to improve, and in less than fourteen days all the serum had disappeared, and in two months the lung had resumed its former function, and the only remaining abnormal condition was the fibro-plastic deposit on pleura, which also in time became absorbed.

Restoration of the pleura and lung to their normal condition after thoracentesis.

One of the most important questions in regard to the future condition of a pleura and lung when a large quantity of pus has been found and remained in contact for several weeks with the delicate serous membrane, was most satisfactorily answered in the following case—that of a girl nineteen months old, whose chest I opened by incision. This child was first brought to my class for diseases of children, February 14, 1870; her mother saying that she had been in poor health for two months, that the little one cried from pain whenever her chest was compressed on lifting her, but she supposed her disease was connected with the liver or spine. On examination, there was dulness over the entire right lung, the liver was depressed, the heart pushed towards the left side, the left lung, although compressed, was by quick respirations able to oxygenate the blood, no disease being detected in it. On the following day I made an incision between the seventh and eighth ribs, introduced the silver catheter, and with a Davidson's India-rubber syringe removed sixteen ounces of thick pus. During the operation the pain was very slight, and after the removal of this pus, she said that she could breathe easier and felt much better.

The wound, which was valvular, was easily closed by three fine silk sutures, then covered by a piece of court-plaster, and a circular bandage and compress applied to the chest.

On visiting her forty-eight hours afterward, the plaster was found to have dropped off. The stitches were removed. Wound entirely healed.

Seven months after the operation her mother brought her to my office, saying that during the past summer she had had several severe attacks of diarrhœa, from which she recovered. On examining the lungs, I found the left in its former good condition, the right lung was resonant over each lobe, and the normal vesicular murmur distinctly heard as the parenchymatous tissue over nearly its entire extent demonstrated a return to a healthful condition; there was no remaining deformity of the chest, the liver occupying its proper place, and there was no reason to doubt her entire recovery.

Fourteen months after the operation of thoracentesis the child

died of cholera infantum, without ever having had the slightest symptom referring to any lung complication.

Necropsy.—Body well nourished. As there had been no noticeable abnormal condition other than the inflammation of the bowels, the abdominal and thoracic cavities only were examined. No peritonitis; the mucous membrane of the bowels presented the appearance of recent acute inflammation and cause of death. The left thorax and contents were normal.

On removing the right lung it was found adherent at several points, by pleuritic bands at the superior and posterior border, which, from the ordinary lung action, were becoming less and less, showing places where former adhesions had existed, but had been entirely overcome, leaving points of deposit of old fibroplastic exudate.

Over the surface of the parenchymatous pleura, deposits of this fibrinated lymph were visible, but almost the entire serous pleural membrane had resumed its secreting and shining smooth surface. The lobes were all inflatable. On cutting into the parenchyma, the only abnormal conditions existing were four or five portions of compressed lung about the size of nutmegs—not the slightest sign of degenerative disease. There were no cheesy or tuberculous deposits found in any part of the body, demonstrating that a return to perfect health may be expected after empyema or thoracentesis.

Spontaneous cure of empyema by discharge per bronchi.

Niemeyer states that a penetration of the pus into the lungs, and its discharge by way of the bronchial tubes and mouth, rarely ends in recovery. I have had a patient thus cured by nature, when as much as thirty ounces of thick, creamy pus came up by the mouth in a single day. He was occasionally during the intervals of rest placed in the most favorable position to favor drainage by the air-passages. At the end of the first week his distressing cough was relieved. Convalescence steadily continued, and in a letter to me one year and four months afterwards, he stated that he was in good health, and was able to perform all the duties of an active business man.

In one instance, the pressure from within the chest from the accumulated fluid was so great that a disarticulation at the sterno-clavicular junction followed; and it is in accordance with

statistics, that openings made by nature are generally either at the apex or base of the thorax.

After I had operated, I reduced the dislocation; the parts were easily maintained in their normal position, and perfect cure followed.

An empyema entirely cured without the operation of thoracentesis.

The following instance clearly shows that the conservative hygienic measures resorted to fully justified my decision not to operate so long as no alarming symptoms occurred, and where all that skill and wealth could possibly do to hasten recovery were at our command.

Boy, three years of age, passed the acute stage of purulent pleurisy, his right thorax becoming so filled with liquid that the rotundity of the chest was increased, and the lung on the right side was for weeks rendered useless.

This little boy had a waxy countenance, was very leucocythæmic, had a short hacking cough, hectic fever, and night-sweats, irregular, frequently palpitating heart, and was extremely emaciated.

Tonics were given, combined with the tincture of the chloride of iron in ten-drop doses. His parents lived in one of the most salubrious parts of New York City, which early in the season they left for a pleasant country residence, and during the midsummer, for a long season, kept the child in the out-door air of the Adirondack Mountains. All the pathological conditions gradually left, and at the end of one year the lung had resumed its normal condition, the liquid all absorbed, and in two years, from being a feeble, fretful, irritable child, he became happy, and so active that he is now the joy of the house, promising not only to become a healthful, vigorous man, but bright and intellectual.

An opposite pneumonia, occurring while the empyema is being treated by a free incision, and the lung is consequently in a state of collapse, is one of the most dangerous complications that can arise.

I had one fatal instance where this took place at a time when the patient had almost entirely recovered of his pyo-thorax, but where this complication coming on deprived him of the use of the lung that had almost carried him through a convalescence;

and, as no lung was left in a normal condition, death followed, as occurs in simultaneous double pneumonia.

Is the operation justifiable, when far advanced tubercular phthisis is known to exist?

The good result following the removal of sixty ounces of pus from the following young lady, aged 21 years, I think conclusively answers in the affirmative. On June 23, 1868, I was hastily summoned, for the first time, to see Miss A. F., whom I found supported by friends in the sitting posture, gasping for breath, bathed in cold perspiration, and suffering from intense lancinating pleuritic pain.

On examining the chest, I found complete dulness over the entire surface of the left lung; diagnosticated a large collection of pus in the thoracic cavity, rendering completely useless the left lung, and pressing on the opposite diseased lung, causing her to be in the greatest misery and apparently dying.

By a very small and almost painless incision with the scalpel, I opened the chest on its lateral aspect, at the seventh rib, introduced through the opening a No. 8 male silver catheter, at the end of which a Davidson's syringe was attached, and, by slow, steady aspirations, withdrew sixty ounces of offensive, thick, putrid pus.

During the operation, especially when about a quart had been removed, she experienced such relief that she exclaimed, "Oh, thank God and the doctor for such comfort." After the removal of about three pints, she had occasional radiating pleuritic pains, caused by the compressed lung expanding. Stimulants were freely given to increase the enfeebled cardiac action, and the operation discontinued, as the symptoms indicated too sudden removal on the pulmonary tissue. When nearly half a gallon had been removed, she unguardedly turned to look at the vessel containing the thick, creamy, offensive pus, and from the shock had an attack of syncope, which was in less than a minute relieved by placing her in the recumbent position and giving teaspoonfuls of brandy. All distressing symptoms were readily relieved, the operation continued, and at the termination she was so much better that she could respire quite freely so long as no air was permitted to enter by the wound. Two or three times during the operation, and on withdrawal of the catheter, a small quantity of air passed in, producing such dys-

pnœa as to prove conclusively that she could not tolerate a large incision, for the free admittance and exit of air.

The wound was, therefore, hermetically closed, and in three days had entirely healed.

She regained her strength so rapidly that in one week, I found, on visiting the house, that she had gone to Central Park (which was just opposite), and for the several succeeding days following was able to take her daily walks.

She continued to recuperate until July, when the weather became intensely oppressive, and a loss of appetite with gradually increasing exhaustion preceded an easy death by asthenia. She was apparently dying when I first saw her, in the greatest agony, and there is little doubt that the removal of nearly half a gallon of pus relieved pressure on her right lung, prolonged life, gave great ease, and allowed her, when she finally became exhausted, to die comparatively free from pain.

The beneficial effect of hermetically sealing the thorax after injury to the healthy lung and pleura, I observed in a man shot through the lung; the bullet, after passing through his chest, passed through the lung of a second, strong, healthy man, killing him. In this instance, whenever air was drawn in through the wound, his breathing ceased as the lung collapsed, and only when I held my finger over the opening was he able to draw in a breath. The chest half filled with air and blood, which I hermetically closed in, the wound healing in less than three days; severe pneumonia followed, the air and blood left in the chest were entirely absorbed, and the man made a complete recovery.

The evils of introduction of atmospheric air into the diseased thoracic cavity have been greatly exaggerated. I have observed instances of empyema where, as partial collapse of the lung occurred, great dyspnœa followed, and have, therefore, hermetically closed such a wound permanently; the air has been removed by absorption, the lung has recovered and eventually filled the chest cavity, returning to perfect health.

Point of election for performing the operation of thoracentesis.

When the opening is to be closed, I prefer the lateral aspect of the chest, either above or below the eighth rib; this is known not to be the most dependent part, but with the long curved silver or soft India-rubber catheter (No. 8 Eng.), the lowest

portion of the cavity may be reached, even to the diaphragm; and, as there is no danger of the point producing injury, nothing need be feared, and the chest can be emptied of its liquid contents. But when a free incision is to be made and a constant drainage maintained, about three or four inches from the spine along the edge of the latissimus-dorsi muscles, and between the ninth and tenth ribs on the right side, and on the left side between the tenth and eleventh ribs, will be found positions most favorable to permit a constant exit as soon as liquid forms. Again, I would give the caution that in these most favorable positions the trocar ought not to be used, but an incision made with a scalpel, seeing tissue by tissue through which we pass.

Hermetically sealing the opening on the completion of the operation to secure primary union has, with me, given the best results, even when reaccumulations were expected.

A repetition of the operation one or more times has presented better results than when I have resorted to free continuous drainage as a primary procedure.

The free incision for gradual drainage cannot be used in all cases. In 1869 I resorted to this method, using a large roll of oakum to absorb the flowing pus; the child, the grandson of a New York physician, was predisposed to tuberculous trouble, and had an irritating cough, and at each violent paroxysm would forcibly expel quantities of liquid from the opening, causing terror and frightful agitation. The wound was sufficiently large to permit free exit and entrance of air, and continued to discharge for over a year.

In another instance I resorted to the same procedure in a boy twelve years of age, otherwise healthy, when the wound closed and recovery followed in six weeks; also in a boy two years old, where eighteen ounces came away by the first flow; the wound was left open, and covered with large pads of oakum; in four weeks spontaneous closure of the wound occurred, and complete recovery followed.

The objections that I would make to treating all cases of empyema by a free incision, like an ordinary abscess, are: 1st. The impossibility of compressing the walls of the thorax, and thereby, by the free admission of air, change laudable into septic purulent matter; also the almost certain degenerative change that would occur in the entire pleuritic membrane, converting it into a thick fibro-plastic tissue, incapable of ever

again performing the work of a serous membrane. 2d. The permanent collapse of the lung, followed by its carnification or septic, probably gangrenous degeneration (all of which complications I have observed, even where antiseptic injections were used), the long-continued drain on the system, and the fatal result that almost inevitably followed in a very large proportion of the instances where it was adopted.

The use of sulphuric ether or chloroform has been very much feared where so large a proportion of the pulmonary tissue had been rendered useless. I have given each of these anæsthetics under the most unfavorable circumstances, and have never known a serious result; but with our present knowledge, never under any circumstances would I use chloroform as an anæsthetic, although I have given it for the removal of necrosed ribs when the pericardium was completely uncovered, and have had the ether administered when the thoracic accumulation was so great as to cause displacement of the heart and luxation of the clavicle; in the former temporary cardiac syncope occurred, and in the latter the sleep was as peaceful as an ordinary slumber.

But since Dr. Richardson's paper on Local Anæsthesia I have resorted to that simple, most effective, and perfectly safe method. I use the ordinary hand atomizer with sulphuric ether, which, in less time than it would take to produce general anæsthesia, causes a circumscribed space, about one inch in diameter, to be made so insensible that the operation will be rendered almost, if not entirely, painless.

Objections to the use of the trocar for thoracentesis.

Dr. Watson[1] relates a case seen by him, where death was caused by using the trocar; he states that the integuments of the side were œdematous, and it was thought that a little serum issued upon the passage of the grooved needle. The serum must have come from the infiltrated areolar tissue. No liquid was evacuated by the trocar. The patient died a day or two afterward of peritonitis. The instrument had perforated the diaphragm, and entered the spleen, which was unusually large.

Laennec[2] also had death follow the use of the trocar, where the operation was performed at his favorite site, viz., between

[1] Watson's Practice of Medicine, London, 1857.
[2] Ibid., 1875.

the fifth and sixth ribs; he thrust the instrument, as he supposed, into the thorax, and was a good deal surprised to find that no gush of liquid followed its introduction. The patient died, and dissection showed that the trocar had entered the cavity of the abdomen after transfixing the diaphragm, which, having been forced upward by a large liver, had contracted from adhesion to the seventh rib.

Other more recent instances have occurred, where by the use of the aspirating needle of Dieulafoy the lung has been pricked. There are also recorded instances where the needle has broken off and remained in the thoracic cavity.

The removal of portions of the ribs, to allow a permanent contraction of the thorax, has been resorted to in some cases where, from the septic condition of the thoracic contents, a free admission of air from a large opening was desired, and for the purpose of washing the cavity where from known permanent loss of lung tissue a restoration of the organ to its original size could never be expected. Such an operation was also devised to hasten that sinking in of the affected side which unaided nature takes so long, if ever able in these cases, to accomplish, thereby cutting short that indefinite period of fistulous discharge and continued source of depletion to the patient.

The great inequality in the external contour, as well as in the chest cavity, has been apparent in those instances where, after years of gradually yet continually diminished lung calibre, the necropsy has shown the remaining cavity to contain one-half, more or less, of the restored parenchymatous tissue left capable of producing a change of the venous into arterial blood, and which part of lung tissue might be the means in an opposite pneumonitis of carrying the patient through all the stages of the disease until restoration would have permitted it also to resume its appropriate state, to the harmonious working or at least a partial restoration to ordinary health.

Rapid death may sometimes occur, even during the primary operation, and has been attributed to a variety of causes. I have never seen death in any way caused or hastened by thoracentesis, but on two occasions have had alarming symptoms occur, first, from ordinary syncope, the shock or dread causing the patient to faint, and also a shock on the sudden change of position of the heart and lung as they resumed their normal positions during the diminution of pressure from the opposite side. These

distressing symptoms have always ceased when I have followed the following rules: Place the patient's head and shoulders low, and if a large quantity has been withdrawn allow the pressure to be renewed by rolling the patient on the well side, so that the organs can be again partially compressed and the heart and lung returned to where they were before the withdrawal of the fluid, give cardiac stimulants, apply friction to the extremities, and enjoin rest for a few minutes—until the circulation and respiration are harmoniously restored.

Can thoracentesis be performed during pregnancy? has been answered in the affirmative. In a paper read before the Société de Chirurgie, Paris, an account is given of an operation on a woman in the seventh month of pregnancy, without disturbing gestation; a healthy child being born at full term.[1]

The siphon method[2] with the mercury manometer offers a means by which a slow, gradual, and steady flow can be accomplished, and at the same time the inter-thoracic pressure can be definitely watched. Dr. Ellis recently removed by this method from one patient one hundred and thirteen ounces in sixty-five minutes, the patient not expressing pain or discomfort, the flow being so gradual and uniform; and Dr. Garland, by opening the valve of the manometer, was able to read the amount of hydrostatic pressure in the chest.

The anhydrous method, of not even permitting water to come into contact with the external wound, has in a number of instances inclined me to conclude that empyemata do better when this method is followed; providing that no perforation of the lung has occurred, producing a pneumo-pyo-thorax; we thereby do not add another factor towards producing that molecular change in the remaining entombed pus globules which so soon occurs on the addition of water, whereby their cells are ruptured and their contents placed in a more favorable condition to undergo that septic change and decomposition unfavorable to recovery.

Conclusions.—Thoracentesis, or removing from the lungs the diseased parts, or the accumulated results of disease from within the thoracic cavity, are operations I have successfully performed without a fatal result twenty-one times during the past fifteen years. Any physician with an accurate anatomical knowledge

[1] N. Y. Med. Journal, Sept. 1876, p. 307.
[2] Boston Medical and Surgical Journal, April 15, 1880.

can perform thoracentesis, when necessary, in any remote rural district without an assistant, with any small instrument having a cutting edge, and, if drainage be desirable, a piece of any hollow plant or the large quill of a feather with openings made along its side, introducing the hard end into the opening made between the ribs (if more complicated instruments cannot be had); and may thus be the means of saving a valuable life.

Thoracentesis ranks among the first operations in surgery in saving life.

Thoracentesis is justifiable to prevent pain and prolong life where an ultimate recovery of the lungs cannot be expected.

Thoracentesis has been followed by a complete restoration to health.

Complete absorption has followed when air, pus, or serum has been left in the chest after thoracentesis.

The costal and pulmonary pleural membrane may be restored to its former healthy condition under favorable circumstances after thoracentesis for the removal of either pus or serum.

General or local anæsthesia may be resorted to, to prevent pain or shock of the operation.

Hectic fever, the result of unhealthful decomposition, ought to be relieved by a free incision, to promote thorough removal of the effete matter, and disinfecting cleansings of the entire lining membrane of thorax, thereby removing, as quickly as possible, all material favoring septic disintegration of the pus and blood globules prior to absorption into the general circulation.

By my recorded illustrations I have shown that thoracentesis can be successful on the nursing infant as well as on the adult; can be resorted to when both lungs are diseased, and even in far advanced pulmonary consumption, where the lungs are compressed by surrounding matter; and that relief from distressing suffocation can be obtained, life prolonged, and painful death averted.

LAPAROTOMY AND COLOTOMY, WITH FORMATION OF ARTIFICIAL ANUS FOR OBSTRUCTION OF INTESTINES.

By WILLIAM A. BYRD, M.D.,

ILLINOIS.

Mr. Chairman and Gentlemen:—

It is because I believe it to be an act of professional duty peremptorily required by the unsettled position of this operation in the minds of the most eminent surgeons, that induces me to report the following case for your consideration and criticism:—

January 14, 1880, I was called by Dr. Joel G. Williams, of Fowler, Illinois, to see Mr. John B. Gilmer, of Coatsburg, Illinois. The patient was a farmer, aged 43, who had been suffering with enteritis for some three months, but for some three weeks before I saw him he had ceased to have any discharges from his bowels, except blood and mucus. He had been seen by several physicians, all of whom pronounced his case hopeless, except Dr. Williams, who, thinking laparotomy offered some hope, telegraphed for me. I found the patient emaciated, and worn out with pain and the want of sleep. There had at times been vomiting, but it was not a constant symptom, and at no time was it stercoraceous. The abdomen was tympanitic and so greatly distended as to almost prevent breathing and greatly crippling the action of the heart. Having four or five years ago successfully relieved a patient, who had typhoid fever, of excessive tympanites, for Dr. Francis Drude, with the aspirator, I decided to try the same treatment in this case. The needle was passed into the abdomen at its most prominent and resonant part, about two inches above the umbilicus, and a large quantity of gas withdrawn, causing great relief. I now decided that the obstruction was in the left iliac region, and that lapar-

otomy offered about the only chance for his life. The obstruction had before been supposed to be situated at the ileo-cæcal valve. Injections had been resorted to, and a soft rubber tube passed up the rectum, which folding or rolling up on itself left the impression that the obstruction was higher. I was so deceived myself. The patient was so much relieved that he wanted any farther interference deferred.

16*th*. Was sent for again, and found the tympanites nearly as great as before, and the patient anxious for an immediate laparotomy. It being late in the afternoon, and wishing to operate antiseptically, I aspirated again, and ordered a drachm of fluid extract of opium per rectum, and promised to return early the next morning. I requested Drs. J. A. Wagner and E. B. Montgomery to accompany me, but Dr. Montgomery was prevented by an obstetrical case.

17*th*. At 9 A. M. we commenced the operation, first washing the patient's abdomen with carbolized water, one to forty, and shaving the abdomen. The assistant's hands were carefully washed in carbolized water, then oiled with carbolized olive oil. Drs. Joel G. Williams, J. A. Wagner, H. C. Skirvin, and Messrs. Chas. M. Gilmer and Richard Powell acted as assistants. Putting the patient under the influence of ether, the abdomen was opened for eight inches in the median line when the distended bowels poured out. The distension of the bowels was so great that before a proper search could be made for the obstruction the gas had to be removed with the aspirator, which was done by inserting the needle of the aspirator into different points of the intestines until they collapsed. Two knuckles of ileum and the sigmoid flexure of the colon were now found bound down in the pelvis and occluded by a band passing from one knuckle of the ileum over and including three-fourths of the diameter of the other knuckle, then splitting like a Y and inclosing the colon. The band was very vascular and about the size of my little finger, and round at its commencement, flattening and spreading out fan-shaped before it became attached to the peritoneum over the left ileum and sacrum. Where it passed over and was attached to the second knuckle of ileum it was about an inch and a half wide. I ligated the round part of the band with carbolized silk, divided it between the ligature and second portion of ileum, then cut off the ends of the ligature near the knot and dropped the pedicle. The second knuckle I enuclea-

ted, having considerable hemorrhage. The blood oozed up from the whole of the denuded surface of the bowel. This was at length stopped by repeatedly applying sponges squeezed out of hot water. The adhesions over the colon were so firm, and so intimately connected with the great pelvic vessels, and so deep in the pelvis as to prevent my seeing what I was doing, that I decided the safer plan would be to make an artificial anus in the left iliac region. This I did by making an opening two inches and a half long, through the walls of the abdomen, just internal to, and above, the internal abdominal ring; then passing four threaded needles through the colon, an inch and a half apart longitudinally, and three-quarters of an inch apart transversely, and carrying them through the opening and stitching the colon by that means to the edges of the opening so as to prevent fecal extravasation into the abdominal cavity; then opening the colon through the hole in the abdomen between the stitches. When the colon was opened, from a quart to three pints of feces poured out and a like amount passed during the night. The bowels, which had been kept wrapped up in flannel wrung out of warm water during the operation, were now carefully cleaned and replaced, and the central abdominal incision closed with twelve carbolized silk sutures. A strip of rubber dam two inches and a half wide was dipped into carbolized water and laid over the abdominal wound, and held in place by three pieces of adhesive plaster, three inches wide, passed around the whole body, exerting even pressure from the ensiform cartilage to the anterior superior spinous processes. Over these, and covering the whole abdomen, absorbent cotton three inches deep was laid and held by a broad flannel bandage snugly applied. The operation was conducted under a spray from a DeBeer's antiseptic steam atomizer, the solution being one of carbolic acid to twenty of distilled water. The whole operation occupied two hours, and when finished the patient seemed about dead, but was revived by hypodermic injections of dilute alcohol and the application of hot irons and bricks around the body.

Half drachm doses of fluid extract of opium were given per rectum, as often as necessary, to keep him slightly narcotized. Injections of two ounces of milk and half an ounce of whiskey were given every two or three hours. His pulse would fill up and become slower after each injection. By the mouth he was given teaspoonful doses of milk and lime-water every half hour.

This treatment was faithfully carried out by Dr. Williams until the third day, when he was allowed larger quantities of milk and lime-water by the mouth. By the end of a week he was permitted to take solid food sparingly.

His condition rapidly improved, with the exception of the tenesmus and passage of small quantities of mucus per rectum, to relieve which ten drops of fluid extract of opium in a little starch water were required two or three times a day by injection. Wishing to overcome the constriction in the colon to permit the closing of the artificial anus, I visited him Feb. 17th, and tried with small bougies to effect a passage, but failed. March 22d, he came to Quincy, and the next day and the day after I made ineffectual attempts to get through. These efforts, though very gently and carefully made, caused him to have some fever, from which he recovered in two or three days and returned home.

April 15th, I visited him, without notification, with Dr. Williams, and found that he had been engaged the previous day hauling fence-posts, and he had intended going that morning several miles after a wagon load of lath, from which he was dissuaded by his wife on account of the inclemency of the weather. We gave him ether, and I inserted my left hand into the rectum and the two first fingers of my right hand into the colon through the artificial anus, and gradually worked the finger-tips of each hand toward the other until the obstruction was overcome and I was enabled to pass two fingers through the strictured portion. This I was the more easily enabled to accomplish on account of there being a large ulcer upon the lower surface of the stricture. After breaking down the very large flabby granulations with which it was filled, there was but a very thin band of obstruction to overcome. A long drainage tube was passed through the bowel, emerging from the anus and artificial anus, and tied over the groin; this was used as a guide for the passage of rectal bougie morning and evening.

The most of his feces passed per anum from the time of the dilatation of the stricture. The artificial anus had exhibited a great tendency to close up, causing much pain when the feces passed through it.

The treatment of the case before I was called had been somewhat varied—purgatives, opium, and chloroform by inhalation. After the tympanites became excessive the treatment was with

opium and chloroform by inhalation—the chloroform affording the most relief.

The conclusions I arrive at from considering this case are: that no one should be allowed to die from intestinal obstruction, and I am not prepared to exclude intussusception, without at least an exploratory incision to make sure that operative interference could afford no relief.

If there is much distension of the bowels with gas, it should be evacuated with the aspirator, as paralysis may be produced by prolonged over-distension, thus defeating the aim of the operation.

If there is occlusion that it is not advisable to overcome on account of exhaustion of the patient from prolongation of the time the abdomen is open, or other complications, an artificial anus should be made and the obstruction treated, if possible, more safely at some future time.

Proper rectal alimentation and medication very materially aid in the patient's recovery.

In submitting this case it is perhaps well to state, as a plea for even a slight right to pass judgment upon abdominal section for whatever cause, that I have now made the section, including operations for strangulated hernia and ovariotomy, eighteen times with the loss of but three patients. All of those three were cases where the section was made for strangulated hernia. One of the fatal cases was eighty-seven, another seventy-six years old, and the remaining one was a man in the last stages of consumption that I only saw once, and that the night I operated.

I believe in true conservative surgery, not that kind that stands considering about an operation until all hope of a successful issue has passed away, but true conservatism that gives a patient all the possible chances of life.

I would like to quote the opinions of such distinguished surgeons as Ashhurst, Gross, Agnew, Hamilton, and others, if time would permit, but will close with a quotation from Mr. Thomas Bryant, made before the Cincinnati Medical Society Jan. 13th, 1880, by Dr. Carson, while discussing an able paper on "Intestinal Obstruction," read by Dr. Wm. B. Davis:[1] "I hold that in all cases of acute intestinal obstruction that resist medical treatment, operative relief should be resorted to as soon as a

[1] Boston Medical and Surgical Journal, Feb. 26th, 1880, p. 202.

reasonable diagnosis has been made, and that, as in a desperate case of strangulated external hernia, an exploratory operation should be performed in most cases. I believe that the physician or surgeon has no right to waste time whilst he is speculating as to the exact seat of the obstruction or precise cause by which it has been brought about, since there is no room to doubt that during this ruminating process the prospects for recovery are rapidly diminishing. Indeed, I believe a surgeon may as well delay in cutting the rope in a case of suicide by hanging whilst he is speculating as to the influences which have led the man to perpetrate the act, as to delay operative interference in a case of acute intestinal obstruction with the hope that he will be able to make a scientific diagnosis of the case, or that something will turn up by which relief may be obtained."

"I maintain that it is *not required of the surgeon to diagnosticate the precise cause of the obstruction so long as the diagnosis of its existence can be determined;* and do not think, because such cases as these occasionally recover without operative treatment, we should forget that a large majority die miserably, unrelieved. I plead, therefore, for the majority."

A CASE OF TORTICOLLIS CURED BY DIVISION OF THE STERNO-CLEIDO-MASTOID MUSCLE FOLLOWED BY ELASTIC TRACTION OF THE HEAD.

By ALFRED C. POST, M.D., LL.D.,

NEW YORK.

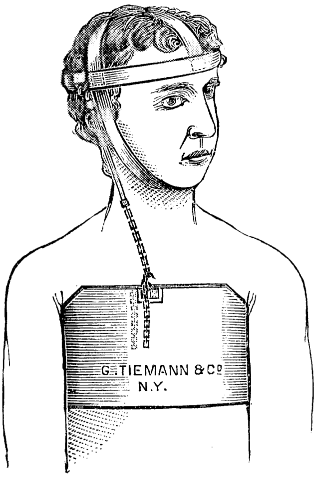
Frederick Platt, ætat. 16, admitted into the Presbyterian Hospital April 1, 1880. He was affected with torticollis in a very marked degree, and had been so from his earliest recollection. His face was strongly turned towards the right side, and his left ear was approximated to the corresponding shoulder. The left sterno-cleido-mastoideus was firmly contracted, and offered strong resistance to the movement of the head in the opposite direction. Its sternal and clavicular origins were very hard and prominent.

On the 9th of April, the patient being etherized, I performed the following operation: I made a horizontal incision, six centimetres in length, along the upper border of the sternum and clavicle, exposing the prominent tendons of the sternal and clavicular portions of the sterno-cleido-mastoid muscle. I then passed a director under each of these tendons successively, and divided them with a sharp-pointed bistoury. The division of these tendons scarcely produced any perceptible effect in liberating the movements of the neck. On careful examination, I found that there were other and deeper bands of muscular fibres, which kept the muscle in a state of tension, and which restrained the free rotary motions of the head. These bands were successively divided upon the director, and then the head could be freely moved in all directions. A few carbolized horse-hairs were then laid within the wound, which had previously been washed with a carbolized lotion 1 to 40. The edges of the incision were brought together with fine sutures.

Before the operation the house surgeon, Dr. John A. Wells,

had applied a plaster of Paris jacket around the chest, and over the right shoulder, with blunt metallic hooks over the sternum and over the right shoulder. A helmet had been constructed (Fig. 1) under my direction by Messrs. Tiemann & Co., consist-

Fig. 1.



ing of a horizontal band of iron encircling the head above the ears, a vertical band of iron passing over the sagittal suture and riveted to the horizontal band in the frontal and occipital regions, and a leather strap passing transversely over the top of the head, and buckled beneath the chin. To the horizontal band of iron was attached a hook over the mastoid region, and two others, one a little before and the other a little behind that point, to vary the direction of traction, if it should be deemed necessary. This helmet was applied to the head of the patient, and an India-rubber muscle provided with a ring at the upper end, and a chain at the lower was then applied as nearly as possible in the direction of the right sterno-cleido-mastoid muscle, the ring above being hooked over the right mastoid process, and the chain below being hooked over the sternum. This was found to accomplish the object for which it was designed in a very satisfactory manner. It turned the face to the left side, and it approximated the right ear to the right shoulder. Two days after the operation, about half of the horsehairs were withdrawn from the wound, and the remainder on the following day. There was scarcely any perceptible irritation about the wound, and union took place by the first intention. The India-rubber

muscle was daily removed and reapplied with such a degree of tension as seemed to be required. Passive motion of the head was also freely made in all directions. Occasionally a supplementary India-rubber muscle was applied, extending from the right shoulder to the corresponding side of the head. The patient left the hospital on the 26th of April, seventeen days after the operation, having perfect freedom of motion. He was directed to wear the apparatus for a few weeks at night, but to leave it off in the daytime, and to practise systematically free movements of the head in all directions.

This case is remarkable for the rapid and complete cure of a marked and rigid distortion of the neck of many years' standing. The successful issue of the treatment is mainly due to the complete division of the muscle whose contraction produced the deformity, and to the admirable manner in which the elastic tube gently but firmly, and without weariness or intermission, drew the head in the direction opposite to that of the deformity.

With regard to the division of the sterno-cleido-mastoid muscle, I am satisfied that the method of open incision with the aid of a director is preferable to the subcutaneous incision. If I had undertaken the operation by the subcutaneous method, I should probably have divided only the hard prominent and superficial bands, which could be readily felt through the skin, and should have gained very little by their division. Or, if I had undertaken to thrust a tenetome beneath the deeper bands, I should have endangered the important vessels which lie in that vicinity. In conclusion, I would express my obligations to Dr. Wells for the application of the plaster jacket, and the Messrs. Tiemann & Co. for the skill with which they carried out my views in the construction of the helmet, which contributed largely to the success of the treatment.

NOTE.—Nov. 9, 1880. I had an opportunity this evening to present the patient to the Surgical Society of New York. The cure has stood the test of time, being as perfect as when the paper was submitted to the American Medical Association in June.

PATHOLOGY AND TREATMENT OF SYPHILIS.

By F. N. OTIS, M.D.,
NEW YORK.

Mr. President and Members of the
American Medical Association.

Gentlemen: It is now nine years since I first invited the attention of the medical profession to the *physiology of syphilitic infection.* This was in a paper read before the New York County Medical Society in June, 1871, and again attention was called to this subject in another paper before the same society in May, 1872—the latter on the *physiology of syphilitic infection as applied to the successive manifestations of the disease.*

In the first paper it was shown, by citations from leading authorities throughout the world, that there was at that time an entire lack of harmony in regard to their views as to the nature of syphilis and the manner in which the human system was infected by it; that, in regard to various leading doctrinal points, an almost equal number of distinguished authorities were diametrically opposed to each other. The virulent nature of the disease was generally agreed upon. Inoculation of the secretions of one suffering from syphilis was accepted by all as a necessity for the production of the disease. Unanimity on this point had resulted from extended and studious clinical observation. Here, however, unanimity ceased, and at the first approach to a consideration of the physiology and pathology of the disease, division of opinion ensued. Two great parties arose: one claiming that on the instant of contact between the so-called virus of syphilis and an abraded surface on a healthy human subject, the entire organism became pervaded—permeated with the disease; not only independently of all known physiological processes, but in defiance of all known physical laws. While the other party insisted that a distinct interval, one of several days, always elapsed between inoculation and constitutional

infection. The chancre or initial lesion of syphilis was claimed by the first party to be the result of the general infection, manifesting itself by a local reaction at the point of original contact or inoculation: while the second claimed that the chancre was the first and only direct result of the application of the virus, and that the constitutional affection resulted through a gradual invasion proceeding from this point. The one claimed, as did Auspitz and Kölliker in 1879, as a result of clinical experience, that excision of the chancre may wholly prevent the occurrence of constitutional infection; while the other, with Berkeley Hill, insisted, from most positive personal experiment, that destruction of the lesion of inoculation is wholly useless in preventing general syphilitic infection.

The fact that these parties were then and are to-day thus opposed on vital practical issues is a sufficient commentary on the value of purely clinical experience in deciding questions involving observations on important physiological and pathological processes.

Instruments of precision have become essential to progress in every department of science, whether in the organic or in the inorganic world. What the telescope has done for astronomy, the microscope has done and must continue to do for physiological and pathological science. The researches of Virchow, of Stricker, of Wagner, Billroth, and Rindfleisch, of Beisiadecki, Cornil and Ranvier, Beale, Chauveau, Burdon Sanderson, and a score of other distinguished scientific workers with the microscope have, during the last quarter of a century, thrown floods of light into the mysterious processes of the human organism in health and disease. But we look in vain through the numerous works on venereal diseases which have been issued during that time to find the advances in pathology and physiology applied to the adjustment of the great and much vexed question of syphilitic disease.

It was with the avowed object of bringing such knowledge, scattered through the literature of that period, to bear upon these matters, that the physiology of syphilitic infection became a subject of study, and subsequently, of the papers referred to as having been presented by me to the profession nine and eight years ago. Since that time I have neglected no known opportunity of availing myself of every personal clinical experience and of all advances in physiology, histology, and pathology

which might promise support to or which might tend to overthrow the materialistic position which I had felt impelled then to assume, as against the supernatural views held by accepted authorities. My effort was made in the direction of placing the question of syphilitic infection upon a rational footing, and was then based chiefly upon the published investigations of Beale, Burdon Sanderson, and others in regard to smallpox and vaccinia, the cattle plague, and relapsing fever. These gentlemen claimed to have demonstrated by microscopic examinations that a living germinal cell was the starting-point of the disease in each case; that this cell possessed the power and properties of the human white blood corpuscle, in so far as growth, movement, and proliferation were concerned; that it was much smaller, more active, and, though less tenacious of life, was still capable of maintaining its vitality after removal from its seat of development and deposit upon another locality, so only that a suitable pabulum were furnished. Beale also claimed that another cell with similar properties and powers, and descended directly from degraded cell elements of human origin, was the starting-point of syphilis.

The well-known fact that all efforts made previously to this claim and subsequently to it, and they had been numerous, had failed to discover the physical entity or representative of the so-called syphilitic virus did not then, and does not now, militate against it, from the fact that only something foreign to the normal tissue elements has been looked for.

This degraded human germinal cell of Beale was represented as varying in size from a five thousandth to one hundred thousandth of an inch in diameter, with nothing in its composition or in its physical properties to distinguish it from the nuclei, the nucleoli, or the granular bodies of the normal white blood cell.

With nothing but its morbid activity and increased capacity for proliferation to distinguish it from the normal cell elements —being itself, in point of fact, a diminutive white blood cell— it is not surprising that such a cell, as a disturbing element in the blood, in the tissues, and in the nutritive fluids of persons affected with syphilis, should have eluded microscopical research. The signal failure of Lostorfer and others to discover any peculiar or substantial virus, had left the subject of syphilis in the same obscurity as when Fernel, in the middle of the six-

teenth century, classed it with the poisons of hydrophobia and the plague as "A mysterious power to enter and vitiate the blood." In all the works on syphilis which I was able to consult, there was no evidence that any distinct connection had been recognized between the initial lesion and the subsequent manifestations of the disease. Each one of these even stood separate and distinct from every other. The simple clinical fact that the initial lesion was the first tangible evidence of the disease, and possessed certain marked physical characteristics, was noted; that, after a mysterious period of rest, enlargement and induration of adjacent lymphatic glands succeeded; that, after another unexplained interval, a cutaneous efflorescence occurred, accompanied perhaps by a pharyngeal congestion, possibly by ulceration of the tonsils. Then, possibly, after still another mysterious interval, a papular eruption of the skin and mucous membranes appeared; possibly, falling of the hair, inflammation of the iris, periosteal pains; all, or neither; then, after another and a longer mysterious interval, deposits of an anomalous material, called, from its viscid and gelatinous appearance, "Gumma," in the skin, in the testes, in the tongue, in the bones, and in the viscera—producing trouble, sometimes apparently by mechanial pressure, and again giving rise to extensive and unexplainable deterioration or absolute destruction of tissue. But beyond a physical description of these various lesions, and the information that all were caused by the mysterious gumma, no information was afforded. They were summed up as syphilitic manifestations of the different periods, without any attempt at explanation on a basis of known physiological or pathological laws. Therefore, any new view of the subject which could afford even a plausible explanation of the various manifestations of syphilis, in accordance with recognized laws of physiological and pathological science, could not fail to constitute an advance upon this position of acknowledged ignorance in regard to the nature and behavior of syphilis.

The acceptance of the disease germ of Beale, in the first place, furnished a starting-point in harmony with what was known of other contagious diseases, vaccinia, variola, etc. In the second place, it furnished an influence which could be demonstrated as capable of combining with the human embryonal cells whose origin, in recognized measure, and whose especial habitat was in the lymphatic organs and channels, already ac-

cepted as prominently involved in the course of syphilitic disease. It was also a point of no small value that, from the embryonal nature of this disease germ, it could only combine with embryonal elements, and that thus, the formed material—the red blood corpuscles and the tissues of the body—could not be directly affected by it, but that its infecting influence must be confined to the white blood cells of the organism. This at once furnished a reasonable explanation of the strange and well-known fact, that persons the subject of syphilis might be in good general health, following their ordinary occupations, pursuing their pleasures even, while fully permeated, according to the professional as well as the popular idea, with the syphilitic virus. In the third place, with the embryonal disease germ as a starting-point, the disease could only progress through the natural lymph-channels, the lymphatic spaces and vessels which return the excess of embryonal material from any point in the tissues to the general circulation. The disease would therefore be confined to the lymphatic elements in its inception, and virtually to the lymphatic system.

Vague statements had been made by different authors in regard to the probable method through which the general organism was infected by syphilis, but Alfred Von Beisiadecki, of Krakow, was the first to make a suggestion based upon actual scientific microscopical examination of the histological elements of syphilitic tissue. The results of these observations made by Beisiadecki and E. Verson, were published in the Archives of the Academy of Sciences of Vienna in 1867, one year after Beale's announcement of his views in regard to the degraded white blood corpuscle as a starting-point for syphilis.

Beisiadecki says, "I have studied the Hunterian chancre in twenty specimens.

"The induration consists in a *cell* infiltration of the papillæ of the corium and subcutaneous tissue. The infiltrated cells are similar to those in dermatitis. They are round, have one or two nuclei, have a finely granular protoplasm, and separate the connective tissue equally.

"These fibres retain their normal size; they are not infiltrated as in dermatitis; they are apparently denser and more resistant to chemical reagents. But the arrangement differs from that in dermatitis.

"In those places where a rich cell proliferation has taken

place, and in their vicinity still more, we find the neighboring tissue of the vessels, as well as of their walls, abundantly infiltrated with cells. The walls of the capillary vessels of the papillæ are thickened, have a shining and rigid appearance, and *inclose numerous nuclei which project even into the lumen of the vessels.* The adventitia of the arteries and veins is three times its normal thickness, *in consequence of the presence of numerous round, spindle-shaped, and branched cells.* The calibre of the vessels is diminished, but the vessels are permeable. If the induration still increases, we find in its vicinity *an abundant proliferation in the adventitia* of the vessels, and subsequently the adjoining connective tissue-cells enlarge and proliferate. . . . The induration, however, is explained," he further remarks, "neither by the number of cells nor by their peculiar properties, but by the fact that, while in dermatitis we have a proliferation of cells, and also a serous exudation which infiltrates the tissue cells and fibres, in the induration of syphilis we have a dry anæmic tissue, resistant connective tissue fibres, considerably thickened walls of vessels. The dryness of the induration which produces the hardness and also the anæmia *is caused by* proliferation in the walls of the vessels, which makes it difficult for the serum to leave the vessels *and also diminishes their calibre.* And this," he says, "explains why the syphilitic induration breaks down into a molecular mass, and why resorption takes place so slowly. This investigation," Beisiadecki further remarks, "might give us a clue to the mode in which the organism is infected." And again he says, "In consequence of experiments on animals and man, we came to the conclusion that the blood capillaries are surrounded by perivascular spaces, and that the adventitia of the bloodvessels is in part to be regarded as belonging to the lymphatic system. We have seen that the cells of the adventitia are in a condition of proliferation—the larger lymphatic vessels appear as thick cords on the dorsum penis, and the corresponding glands take part in the process. *These cells* FORMED *in the lymphatic system* can easily enter the lymph current and the blood AND BECOME THE CARRIER OF THE CONTAGIUM." From this he concludes that "*the infection of the organism is not caused by the absorption of fluid or of broken-down substances in an unknown way*, but the progressing inflammation of the lymphatics and glands, and *the formation of cells in them*,

and the *entrance of these cells into the lymph current as living elements*, may be regarded as the cause of the general infection."

Beisiadecki does not appear to have been cognizant of Beale's view, published in the *preceding* year; nor did I meet the account of Beisiadecki's investigations until four years subsequent to my adoption of the disease germ of Beale as affording the most probable solution of the mode in which the syphilitic infection was initiated. From a careful study of Beisiadecki's statements it would appear that a local and excessive proliferation of white cell elements characterized the earliest evidences of the syphilitic process; that it progressed chiefly through the lymphatic spaces and vessels; that the induration and also the breaking-down of the tissues at the point of inoculation was caused by obstruction of the vessels of nutrition of the part through the dense cell accumulation. This behavior of the tissues at the point of inoculation—the recognized tendency of the proliferation to progress in the line of the lymphatic vessels—suggested to Beisiadecki that it "might furnish a clue to the manner in which the organism was infected." It convinced him at least that the infection was not caused by the absorption of any subtle emanations or fluid or broken-down substances, in an unknown way; but the formation of cells in the lymphatics and glands, and the entrance of these cells into the lymph current as *living elements*, might be regarded as the cause of the general infection.

Let us now consider the capacity of the degraded white blood corpuscle—the syphilitic disease germ—claimed by Beale to produce the conditions which Beisiadecki and Verson found in the initial lesion of syphilis; let us follow the natural course and influence of a disease germ corresponding to the degraded white blood corpuscle of Beale from a surface of inoculation, side by side with the clinical and microscopical evidences and lesions of syphilis throughout the course of this disease.

Depositing now this disease germ upon the surface of an abrasion occurring as from a recent venereal accident—it is at once immersed in the tissue fluid which the abrasion furnishes, thus affording pabulum suitable for its continued growth and its rapid proliferation. Its contact with the wandering white blood cells which the local irritation has drawn to the part is assured. The known capacity of such cells to receive into their substance the almost infinitesimal germs and to proliferate at increased speed on account of their presence, warrants us in assuming the

possibility—nay the probability—of such a result. Now we are assured by well-authenticated microscopical investigation, that this is exactly what does take place in an actual syphilitic inoculation, viz, that an increased local proliferation of the white cell elements begins and goes on steadily until a nodule of induration is formed, which is accepted by all as characteristic of syphilis. This nodule is made up, according to Beisiadecki and others, solely of white blood cells and the product of new formation resulting from the enforced stasis of those cells. The initial lesion of syphilis is thus shown not to proceed from a destructive process, but from a process of growth; and it is a well-known fact that the mass of cells thus proliferated may exist for weeks and finally become absorbed without showing the slightest tenderness or tendency to ulcerative action: and yet the person upon whom such accident occurs becomes just as certainly and as thoroughly the subject of constitutional syphilis as when the initial lesion was an open tissue necrosis. And further: it is also found that when such tissue necrosis—or more properly, necrobiosis—does take place in the uncomplicated initial lesion of syphilis, this accident is due solely to interference with the vessels of nutrition of the part, caused by the proliferation and packing of cells around the vessels, in their walls and within their lumen, and not from any destructive property residing in the contagious element of syphilis.

The period of so-called incubation in syphilis (really the time which intervenes between the date of inoculation and the implication of adjacent lymphatic glands), in this view of the case, is occupied by a steady cell proliferation at the point of inoculation. This period is apparently longer or shorter in proportion to the distance from the surface of inoculation to the nearest lymphatic vessel. Clinical observation, confirmed by microscopical examination, has shown that during this period, no physical evidences of any diseased action are ever seen in any other part of the body, and that all claims as to the vitiation of the entire organism at the moment of inoculation are without the slightest foundation in fact. An extended clinical experience has also shown that the period of incubation is shortest in those cases where the wound of inoculation is at a point corresponding to the most superficial distribution of lymphatic vessels, notably at the frænum præputii, where the lymphatics lie just underneath the epithelium. Cases of inoculation under such circumstances

have been recorded as having had an incubation of but from one to four days: while in a single instance, quoted in my first paper on the physiology of syphilitic infection, a well-known surgeon received a syphilitic inoculation by the prick of a spicula of bone, during an amputation in a syphilitic subject; gland enlargements of the axilla occurred within twenty-four hours, and were followed by a syphilitic roseola six weeks after.

The movement or current of the fluids pervading all living tissues is shown by scientists to be in a direction towards the lymphatic vessels. The tissue spaces are even claimed to be in open communication with the lymphatic canals. The direction of the current in these canals is of necessity from the periphery of the body towards the great central lymph reservoir—the receptaculum chyli. The office of the lymphatic vessels, as stated by a great German histologist,[1] is to act as drains for the surplus nutritive material; in other words, to return to the blood the nutritive material exuded into the tissues in excess of the necessities of growth and repair, again to be carried into the tissues by the arterial vascular system. The necessity of germinal cells thus present in the tissues would be to progress towards and finally into the lymphatic vessels, thence into the lymphatic channels, and thence into the nearest lymphatic glands.

Clinical experience has shown that recent painless enlargement of lymphatic glands is suggestive of syphilis, and, when taken in connection with a suspicious lesion upon the genitals, is accepted as a proof of the syphilitic cause for that enlargement. Clinical observation, then, coincides with the hypothetical case with which we started, in showing that, as a matter of necessity, the enlargement and induration of the lymphatic glands in direct connection with the lesion of inoculation must soon follow. Actual microscopical examination of glands so enlarged shows them to be literally stuffed with the products of cell proliferation, and that the swelling and induration are due to this cell accumulation which, under the microscope, does not differ in the least from that found in the initial lesion.

Up to this point, according to the usage of authorities, the disease has been termed the primary stage of syphilis. With the purpose of signifying its purely local character, as here claimed, and in view of its apparent progress by a gradual cell

[1] Rindfleisch: Pathological Histology, Am. ed., page 92.

proliferation, the term "*initiatory period of syphilis*" would seem to be more appropriate.

Now, in the natural history of syphilis, following immediately upon the primary or initiatory stage of the disease, another mysterious period of rest, or so-called incubation, occurs, a period averaging fully six weeks. During this time the subject of syphilis, who had been claimed by the advocates of the supernatural views of syphilitic infection to be saturated from heel to crown with the syphilitic virus, is yet seen to be free from every physical sign of syphilis, and from all discomfort at every point, except perhaps that between the lesion of inoculation and the swollen and indurated glands. During this second incubation, however—as has been shown in the first so-called incubation—the cell accumulation is going steadily on, packing the canals of the glands so tightly that passage of a cell through them would appear an impossibility. But that this is finally effected, and that this period of so-called incubation is really due to the time required for the diseased cell elements to effect a passage through the glands, is shown by the fact that, at about the same time, between thirty and forty days, in every case, lymphatic glands at a distance from the seat of inoculation, as in the cervical and epitrochlear regions, suddenly become enlarged through cell accumulation, exactly the same as was found in the glands in immediate connection with the lesion of inoculation, and that about this time a roseolar eruption of the skin occurs which is considered diagnostic of syphilis.

The course of the hypothetical disease germ, as shown, would, of necessity, be towards the great lymphatic reservoir—the receptaculum chyli. May we not claim that the six weeks' delay in reaching it arises from known mechanical obstacles in the substance of the gland, and corresponds reasonably with the so-called period of second incubation; and that, once arrived within that reservoir, it is carried with a myriad of cells—similar cells—degraded by contact and combination with the original disease germs or their descendants, in their passage through the glands, along with the lymph current, and poured, with the normal lymphatic elements, into the general circulation through the subclavian veins?

Thus suddenly set free in the general blood circulation, we naturally expect now to find evidences of constitutional disturbance resulting. And now in point of fact, for the first time in

the history of the infection, does the patient begin to complain, not always, but occasionally, in severe cases, of headaches and general malaise, etc.,—called the syphilitic fever. In whatever manner these troubles are accounted for, it must not be forgotten that the same cell accumulation which has marked the progress of the disease from the point of inoculation to the receptaculum chyli has commenced, and is steadily progressing in the general lymphatic system—a system of vessels and glands, the known source of embryonal elements most necessary to the healthful nutrition and growth of the human organism. The roseola of syphilis is claimed to account for the so-called syphilitic fever; but in the great majority of cases the roseola appears without the slightest constitutional disturbance, and when the constitutional disturbance is present, the appearance of the roseola does not relieve it in the slightest degree. It is, therefore, unlike the disease and the eruption of scarlet fever and measles, with which it has been compared. It corresponds exactly, however, with the sympathetic roseolas, of which Mr. Erasmus Wilson, the great English dermatologist, has described no less than sixteen varieties, dependent upon impressions upon the great sympathetic nerve, producing paresis of the nerves ot cutaneous bloodvessels, through various causes, such as typhoid fever, rheumatism, gout, indigestion, mental emotion, etc.

It is true that Mr. Wilson does not recognize the roseola of syphilis as of this character; on the contrary, he has taught, most explicitly, that this especial roseola was the result of an effort of nature to expel what he termed the syphilitic poison, and described it as "the exanthema which completes the triumph of the pressure from within, and is the sign that the poison is being driven to the surface, and is in process of expulsion."

No better example of the disposition of authorities to attribute the manifestations of syphilis to purely unscientific and supernatural causes than the above could be furnished. It must be remembered that the roseola of syphilis resembles all other roseolas in the suddenness of its advent, and in the fact that it never, under any circumstances, develops into anything else. Its only peculiarity consists in the coppery stain which it leaves upon the skin. This, however, is shown by microscopic examination to be caused by the stasis of blood and the exudation of red blood corpuscles, and this clearly as a result of the paresis

of the nerves of the bloodvessels, from some impression made upon the great sympathetic nerve centres.

Long-continued dilatation of the capillaries and stasis of the blood, says Baumler, are all that is necessary to produce this pigmentation. If, then, mental emotions and indigestions are recognized as capable of producing temporary roseolas, by causing a temporary paresis of the nerves of the blood capillaries, is it too much to ask you to believe that the sudden accession of degraded cell elements into the general circulation would be capable of producing a still greater impression upon the sympathetic nervous system, resulting in a more profound blood stasis, one which should leave its mark as a coppery stain? In addition to the roseola which appears to mark the general dissemination of the degraded or syphilitic cell elements throughout the system, we find enlargement and induration of lymphatic glands at a distance from those directly connected by lymph canals with the initial lesion, and especially prominent in the cervical and epitrochlear regions.

Those examined under the microscope show the same cell-accumulation that characterized the point of original inoculation and the glands first affected, and also, as characteristic of this stage in the infection, congestion of the fauces and tonsils, which may even go on to ulceration. The lymphatic distribution in the tonsils—so extensive that it is accepted by histologists as a form of lymphatic gland—and mucous membrane of the fauces, unusually rich in lymphatic vessels, would naturally be expected to sympathize with the grave disturbance which has been shown to be going on in the general lymphatic system.

Now, although the syphilitic cell elements have been traced, in entire accord with known physiological and pathological laws, from the site of original inoculation through the lymph channels and into the general blood current, and that thus an opportunity has been afforded for the vitiated cells to find their way into the general gland system, and to the mucous surface of the pharynx and tonsils, the exact course taken by them to effect this has not yet been ascertained, the fact alone has been demonstrated.

The course of syphilitic infection towards the periphery of the body is more clear. Carried by the outgoing blood current from the centre of the circulation into the most superficial cutaneous capillaries, it finds here the blood circulation the most

sluggish—a condition known to favor activity of motion and proliferation of all embryonal cells, and to aid them in wandering out of vessels and into the tissues. "Contact with tissues and relative rest of the emigrant cells," says Rindfleisch,[1] "induces them, first, to essay their amœboid mobility, then to division." The extremest point to which the cells may be carried, and thus the greatest degree of relative rest which they may find, will be in the capillaries of the papillæ cutis. Here, too, we find their nearest approach to the lymphatic vascular system. "The capillaries of this system," says Feichman,[2] "lie exactly in the centre of a papilla cutis, while the bloodvessels traverse its periphery, winding up, corkscrew fashion, until they unite at its apex." "The points of union, or of curving," says Rindfleisch, "are constantly dilated. Everything indicates that a certain increase of pressure and retardation of the circulation must occur in the papillæ of the skin." Again, Wagner says, "The resistance which affects the velocity of the blood lies in friction, the velocity is greatest in the arteries, less in the veins, and least in the capillaries." Consequently, it is in this juxtaposition of the blood capillaries surrounding the papillæ cutis and the lymph capillaries passing up through their centres—that is to say, in the tissue spaces intervening between these—that we should expect to find germinal or other material escaped or exuded from the blood capillaries, detained in their natural transit into the lymph capillaries. The office of these latter being admitted, as claimed by Rindfleisch, to return to the general circulation material thus exuded in excess of the necessities of growth and repair, contact with tissue and relative rest of the exuded cells induce them first to exercise their power of independent locomotion and then of proliferation. Thus, here in the papillæ cutis we should expect accumulation of cells similar to those found at the site of the original inoculation. And this is exactly what we do find in the natural clinical history of the disease as confirmed by microscopical examination. Thus Baumler describes the syphilitic papular eruption as consisting of "well-marked circumscribed (cell) infiltrations of the papillary body of the cutis;" and he further

[1] Rindfleisch, Pathological Histology, Am. ed., p. 94.

[2] F. Von Recklinghausen on the Lymphatic System; Sineker's Comparative Histology, vol. i. 297. Sydenham edition.

says, "it is often impossible (microscopically) to distinguish an isolated secondary papule from a commencing primary affection." This statement is but in confirmation of that of Kohn and others, who claim the so-called secondary syphilitic papule to be located originally in the papillæ cutis *alone*, and composed of cells identical with those already described as characteristic of the syphilitic cell proliferation at other points; and "Further," says Kohn, "the cells which make up the body of the papule are not destined to become permanently organized, as they degenerate and disappear, undergo fatty degeneration, or they may become heaped together in the form of detritus and become pus."

Thus it will be seen, that, in point of time of appearance, in point of exact locality, in point of exact composition, in point of subsequent behavior, the hypothetical eruption necessitated by the introduction of the disease-germ of Beale, upon a surface of inoculation on the virile member, and carried by the lymph current through the lymph channels into the general circulation, then carried out with it to its inevitable lodgment in a papilla cutis, there proliferating under the most favorable conditions, produces, as a logical sequence, the characteristic papule known to occur in the natural course of syphilis—the so-called PAPULAR SYPHILIDE.

It will also be seen from the description of Kohn, that the pustular eruptions of this, the secondary state of syphilis, are accounted for as papules, the cell-elements of which become broken down from various causes, constitutional or local, and become pustular. Examination of the mucous patches and tubercles of this stage of syphilis under the microscope shows them to be only papules occurring upon mucous membrane, and in places upon the skin subjected to unusual moisture.

The iritis characteristic of this stage has been shown by microscopic examination to be characterized, if not caused, by the deposit of cells; and the so-called gummy tumor of the iris has been shown to be simply a papule, a mass of hastily generated cells developing in a locality, the anterior chamber of the eye, free from surrounding pressure, and thus assuming the well-known irregularly nodulated form.

The alopecia of active syphilis has been shown to be due to the deposit of cells in the tissue spaces of the hair bulbs sufficient to interfere with proper nutrition. Syphilitic onychia is

found to be similarly dependent upon deposit—excessive localized cell accumulation in the nail matrix. In short, every known manifestation of syphilis, in the skin, in the lymphatic vessels and glands, in the hair, in the eyes, in the nails, in the bones, has been proven beyond dispute, through competent microscopic examination, to be due to one and the self-same cause, viz., an excessive accumulation of white cell elements. Wherever a syphilitic manifestation during this, the active stage of the disease, is found, a crowd of newly proliferated cells is found to account for it, *and nothing else.* The simple mechanical pressure in the tissues, and in the vessels of nutrition of every affected part, is in sufficient degree to account in a rational way, not only for every possible variety of initial lesion, uncomplicated with other disease, but for every variety of constitutional manifestation ever known to occur during the active or so-called secondary period of syphilis, and this, too, in complete accord with known physiological processes, and in harmony with recognized physical laws.

The evidence which brings us inevitably to this conclusion is not simply theoretical, it is the evidence of facts which abut and uphold at every conceivable point the claim that syphilis is a disease of the cell elements of the human organism, that excessive proliferation of these elements and their localized accumulation in the various tissues is the only known direct effect of this disease, and that its influence in producing the localized lesions characteristic of syphilis is chiefly, if not wholly, mechanical. Accepting, then, such a conclusion, what suggestion does it afford in regard to the legitimate mode or modes of treatment? Evidently, the administration of antidotes, or specifics, or specific tonics, can only receive consideration while the disease is assumed to be the result of a specific virus. The existence of such a virus has never been proven, and has been assumed only on purely theoretical grounds; and even then, their administration, however beneficial to persons subjects of syphilis, until the actual discovery of the alleged virus, its real nature and composition, can never be other than empirical. What is wanting to make it scientific is, first, an exact understanding of the work to be done; secondly, an appreciation of the ways in which it may be done; and, thirdly, of the means through which it may be most directly and judiciously accomplished. It seems to me that there is no longer

any occasion to ask, What is the work to be done? There can be no question as to the fact demonstrated by scores of scientific observers, that the tissues affected with syphilis in its active stage are literally groaning under a pressure of cell material manifestly in great excess of the necessities of growth and repair, and acting as foreign material in disturbing the sensation and nutrition of the affected part. It is equally well known that the complete disappearance of these superfluous cells is equivalent to recovery from syphilis. What we want to know, then, in the treatment of this disease is, not an empirical formula, but a reasonable way through which such foreign material may be removed from the system. Nature's way of getting rid of superfluous cell or tissue material is by the well-known process of tissue metamorphosis known as fatty degeneration; what Rindfleisch characterizes as "the regular mode of decomposition for many tissues liable to change."[1] "Fatty degeneration," says Wagner,[2] "is favored by disturbances of the circulation and of nutrition—new formations of every kind, especially of those formed largely of cells," etc.

Now this fully accords with what we occasionally recognize in the natural history of syphilis, viz., a tendency to get well without any treatment whatever. In certain cases nature is, without doubt, fully capable of eliminating the cell products of active syphilis; delay in effecting this, however, is recognized as resulting most frequently in sequelæ, more or less troublesome, which are ordinarily classed under the head of tertiary or late syphilitic lesions. It has, then, from the earliest times, been considered desirable to hasten the cure of syphilis by artificial means. And it is a curious and instructive fact that all the remedies or plans of treatment which have ever found even temporary favor in curing or in mitigating syphilitic disease, have been those which are recognized especially as favoring fatty degeneration. Thus the ancient sweating cure, the treatment by various decoctions and by hot baths, the starvation cure, the syphilization cure, the tartar emetic or so-called tartarization cure—pustules in the one produced by inoculation of unhealthy pus, and in the other by application of the potassio-tartrate of antimony. But throughout all time since the discovery of mercury and the iodide of potassium—agents recognized as par

[1] Page 39. [2] Page 305.

excellence the most effective in setting up and hastening the process of tissue metamorphosis—producing fatty degeneration and elimination of all living tissues—have held the first place, as they do to-day, in the successful management of syphilitic disease.

At times the mercurial treatment has been temporarily undervalued because the true nature of its action was misunderstood; it was given as a specific against the disease generally, or as an antidote to the syphilitic virus so called. As a matter of course, having no conception of what the virus was, or its mode of action, quantity was naturally accepted as an important factor in neutralizing this hypothetical poison and its effects, and it was often given to the extent that the effect of the drug was often found to be worse than the disease. M. Philip Ricord, of Paris, was perhaps the first, through his good sense and great clinical experience, to recognize the value of small doses of mercury, long continued, as the most successful and judicious plan of treatment, and the first to announce positively, as he did in the Clinical Society of London in 1872, that syphilis by this method can be cured. Ricord's great name at once secured him many followers of this method, and some imitators.

Perhaps it was Headland, the distinguished English therapeutist, who led the way to Ricord's views, for, in curious coincidence with the views of syphilis which I have here advanced, he writes, under the head of Antiphlogistics: "Mercury has the power of producing a decomposition of the blood" . . . and in regard to its curative action in syphilis he says:[1] "It seems to me to be not unreasonable to suppose that mercury in its destructive action may seize first on those parts of the blood which are most diseased, or most liable to putrefaction, and that it may grapple thus immediately with the fermenting and multiplying virus of syphilis—decompose it as well as those materials of the blood on which it has commenced to feed, and eliminate these and itself together by the glandular outlets of the frame." Again, p. 185: "Mercury attacks the *plastic* element of the blood . . . . produces a fetid material out of it which is rapidly eliminated." Ricord's plan was to use such a given limited quantity of the drug that the destruction and elimination of the diseased

[1] Headland on the Action of Medicines, Eng. ed., p. 202.

elements—the so-called virus—should go on with the least possible damage to the general system.

With the view of the cell origin of syphilis which has been presented to you—a disease made up of cells hastily generated and thus holding their grasp upon life with less tenacity than the normal structures and cell elements—we shall find of necessity the highest excellence in a treatment which shall most rapidly induce a fatty degeneration and elimination of the diseased cell elements, while falling short as far as possible of disturbing the healthy cell elements and tissues. This brings us virtually to the same practical position as that finally reached by M. Ricord, who adopted his plan, though empirically, yet as the result of sound judgment and experience. We, on the other hand, are forced to it as to a logical sequence of our position in regard to the nature of the disease. We are not fettered to a medicine warranted to act as a specific, an antidote, or a tonic; it is a principle which must guide; and hence, when we meet with an agent that is demonstrated as of greater power in inducing tissue metamorphosis than mercury or the iodide of potassium, or which will better aid us in the elimination of the products of that metamorphosis, then we shall philosophically be bound to make the change. We may also legitimately aid the treatment by any other means which are of known value in producing the same variety of tissue change; and especially shall we find our knowledge of a governing principle of value in the management of syphilis when on account of condition or idiosyncrasy the system of the patient is found to be wholly intolerant of the use of mercury and the iodide of potassium.

What I desire now to make especially prominent is the fact that the course of syphilis, from its inception to its close, is entirely in accord with well-established physiological laws, and that the known facts which go to prove this are joined together by links of evidence, circumstantial and presumptive, of such completeness, that a continuous line of march may be traced, starting from the deposit of the disease germ of syphilis at the point of original inoculation, and followed by its recognized and legitimate influence through all the subsequent manifestations of the disease to its final exodus through fatty degeneration at the close of its course. I desire further to call attention to the fact that the virus of syphilis, in this view of the case, is

simply an influence, and not a physical entity; and that this influence is inherent in all cells, whether healthy or degraded.

Rindfleisch,[1] in speaking of the formation of epithelial structures, says, that "An embryonal formative cell can only then become an epithelial cell when it comes into contact with such. We must believe in a kind of epithelial infection;" and, further, he says, "this must of course just as well obtain where embryonal formation cells, colorless blood-corpuscles, approach an epithelial stratum, as when, conversely, epithelial elements approach embryonal formative cells."

Here, then, we have a contagious element, an infectious principle claimed to exist, in the normal, the healthy development of tissue. Shall we then, because the self-same influence is shown to manifest itself in a diseased condition of the cells, insist that a separate influence, a mysterious and invisible, possibly a tangible virus must have been developed to account for it, and then go on to fight this virus with antidotes and specifics?

Is it a sufficient answer to claim that clinical experience has shown the value of mercury and the iodide of potassium in the treatment of syphilis, that these remedies have been successfully administered as antidotes and specifics and tonics, and that hence antidotes and tonics and specifics they must be? Is it not now time to cease fighting this ever-present bugbear of a virus, when it is proven that the real foe is a tangible, demonstrable material, subject to the same conditions which characterize other physiological and pathological materials and processes?

Is it objected to this view, that the same medicines and measures are made use of which experience has shown most successful and judicious in the management and cure of syphilis, and that, if the same or similar results are obtained, the principle on which the administration of remedies is based is not important? In reply, I would claim that it is just this principle which is important; even though, under the pretence of antidoting a virus, or counteracting it by means of a specific or a tonic, we do actually destroy or aid nature in destroying and eliminating the degraded cell elements which constitute the only known evidences of the disease. It is just this principle which constitutes the difference between empiricism and sound medical science.

[1] Page 101.

In closing this paper on the pathology and treatment of the active period of syphilis, I would like to express myself as in entire accord with authorities like Mr. Jonathan Hutchinson, Mr. Henry Lee, and Mr. Lane, of London, who are practically supported by M. Ricord, Lancereaux, Beaumlee, and others, in viewing the late or so-called tertiary and quaternary lesions of syphilis simply as sequelæ, and not as necessary effects of the disease—as sequelæ, capable one and all of complete explanation, without the necessity of a suppositious virus, and in entire agreement with known pathological processes, and in the fullest harmony with recognized physiological and physical laws.

ASPIRATION IN PERICARDIAL EFFUSIONS.

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This subject seems a proper one to bring before the Association, since patients undoubtedly have died, and probably still die, every year, because the attendant is too timid to thrust an aspirating needle into the pericardium, to relieve the heart of the hydrostatic pressure which threatens to prevent its life-sustaining pulsations. The operation of tapping the pericardium was proposed over two hundred years ago, and yet how few instances of its performance have been recorded! I cannot believe that large pericardial effusion is as uncommon as these cases would seem to indicate. Rheumatism and thoracic inflammations, the great factors in the etiology of pericarditis, are too frequent among us to allow any other explanation of this fact than that pericardial effusions are treated only by medical means, and abandoned if absorption is not accomplished.

When tapping the chest in cases of pleuritis with effusion was introduced, it was the custom to wait many weeks before using operative means for withdrawing the fluid; and many autopsies showed the results of this protracted delay by thickened pleuræ, compressed and useless pulmonary tissue, and perhaps even fistulæ, showing the attendant that nature had done what he had been afraid to attempt. In course of time we learned to recognize the value of paracentesis of the chest, and improved instruments gave it a wider field. Doubtless a similar history will be told of tapping the pericardium, as soon as the profession shakes off the feeling that the heart and its covering will not bear operative interference, and learns that the operation is much less serious than the retention of a large amount of fluid within the pericardial sac.

The causes of pericarditis are too well known to all to require more than a passing notice at this time, and it would perhaps be considered presumptuous in me to attempt to instruct you in the symptomatology, physical examination, and diagnosis of effusion in the pericardium. I shall, however, sketch briefly the main points concerning these topics, in order to bring my subject systematically before you. Pericarditis as a complication of rheumatism is often seen by all of us, though it is not usual for it to assume characteristics of great gravity. Occasionally the fluid effused increases rapidly, and the oppression resulting may terminate fatally. It is in such cases that the most brilliant results have followed tapping, because the distended sac is immediately relieved of its contents, and the primary disease is one of favorable prognosis. Again, pericarditis may occur from the extension of pulmonary inflammations, when the prognosis is rather less favorable than in the former instance. Any condition liable to favor the transudation of serum into the cellular tissue and cavities of the body may be the exciting cause of hydro-pericardium; especially is this the case in chronic disease of the kidneys.

The symptoms of dropsy of the pericardium are of little value, and we have to rely upon physical exploration to make out the diagnosis. The increased dulness, the feebleness of the heart-sounds and apex-beat, and the frequent presence of a friction-murmur suffice, as a rule, to establish the character of the lesion. At times, however, the differential diagnosis between a feeble, dilated heart and a pericardial effusion becomes a matter of considerable difficulty. Very fortunately, in the vast majority of patients the diagnosis can be established, after a careful physical examination has been instituted.

It has recently been asserted that dulness in the fifth intercostal space an inch or an inch and a quarter from the *right* edge of the sternum is a distinctive sign of pericardial effusion, as opposed to any form of cardiac enlargement.

With these prefatory remarks, I shall enter upon the consideration of paracentesis of the pericardium itself, discussing the methods of operating, the best point of puncture, the kind of cases to which tapping is adapted, and, finally, the results which have been obtained.

There is little probability of any dissenting voice, when I say that the best method of puncturing the sac is by aspiration.

An ordinary trocar has been used, and some of the older operators preferred to dissect through the integumentary and muscular layers until the distended pericardium was reached, but this is not as satisfactory as thrusting an aspirating trocar or needle directly through the thoracic wall. The tough integument may be incised first, and the skin drawn down before the needle is introduced. The vacuum chamber ought to be attached to the needle as soon as its point is buried, in order that the flow of serum may tell when the pericardial fluid has been reached. Otherwise the instrument might be thrust onward into the right ventricle, for the thoracic wall is not thick. The best form of puncturing instrument is Fitch's dome-shaped trocar, with the necessary attachment for the aspirating pump.

There have been suggested several points for puncturing the pericardium, but the best, I believe, after numerous experiments and measurements, is in the fifth intercostal space, about five centimetres to the left of the median line of the sternum. This may require some modification in small children, and in instances where pericardial adhesion at that point is suspected. The internal mammary artery runs parallel to the border of the sternum, about a quarter or half inch from it, and must be avoided. The auricle of the heart is in danger, if the needle be introduced through the upper spaces, and if a point too far to the left be selected, there is, as shown by my experiments, danger of passing outside of the left wall of the sac. A puncture in the sixth space might enter the abdomen, after piercing the edge of the diaphragm.

The pleura must in most cases be wounded, because it is reflected over the pericardium from the costal cartilages; hence the aspirating needle penetrates both layers of pleura before it enters the pericardium. In chronic purulent pericarditis there is very probably adhesion here, which is of value, as it precludes the possibility of the pus escaping into the pleural cavity. A small puncture is of importance in all cases for the same reason. As it, therefore, seems hardly possible to avoid puncturing the pleura, the object to be avoided is the mammary artery mentioned above; hence the needle should be introduced between the artery and the nipple. A point well chosen, as stated above, is in the fifth space, about two inches from the middle line of the sternum, which, by the way, is more readily determined than the left edge of the bone, since the tissues prevent accurate de-

termination of this border.[1] The operator must also recollect the fact that the intercostal spaces become narrow as they approach the sternum, and that the cartilages of the lower ribs are inclined obliquely upwards. Unless these anatomical points are thought of, the needle may be thrust into the cartilage and a second selection of a place for operation be necessitated.

You may ask what cases are suitable ones for paracentesis pericardii. The reply to this question is, that in all cases of pericardial effusion in which medication has failed to relieve the heart by reducing the quantity of fluid, and in which grave symptoms supervene, the aspirator should be resorted to at once. This should not be delayed until the patient is worn out, the lungs engorged, and the pericardium converted into a pyogenic membrane, but should be thought of, as it is in pleural effusion, as soon as the inadequacy of drugs is evident. The most brilliant results are obtained in cases in which sudden serous effusion of great amount has occurred in articular rheumatism; here the withdrawal of the fluid averts all danger, and the patient recovers from his rheumatic fever in a few weeks. When there is Bright's disease, chronic pleuro-pneumonia, or purulent pericarditis, it is not to be expected that the success obtained will be so perfect.

It should be remembered, moreover, that renal symptoms may be produced by the kidney congestion caused by the embarrassed heart, and that removal of the pericardial effusion may induce disappearance of the albuminuria.

When the fluid reaccumulates the aspirator should be again resorted to, and if the effusion becomes purulent a drainage tube or canula may be left in the wound. I see no reason why disinfectant solutions should not be employed at times to wash out the pus, though probably this would rarely be necessary.

Finally, let a brief survey be taken of the results of pericardial tapping. The early cases collected in my monograph,[2] recently published, are meagre in detail; and of the diagnosis of some there is reason to doubt the authenticity.[3] Hence I shall

[1] This question will be found fully discussed in my monograph entitled "Paracentesis of the Pericardium: A Consideration of the Surgical Treatment of Pericardial Effusions." Philadelphia: J. B. Lippincott & Co., 1880.

[2] Paracentesis of the Pericardium. Philadelphia, 1880.

[3] Hindenlang also gives a number of early cases. See Deutsches Archiv für Klinische Medicin, 1879.

speak of the cases operated upon in the last twenty years, of which we are able to obtain more accurate information. Taking the cases in the monograph mentioned, with the new ones in the subjoined table, I have 42 cases of paracentesis performed since 1860. Of these there were, recoveries, 14; deaths, 28; total, 42. This gives a mortality of $66\frac{2}{3}$ per cent., which does not seem high, when it is recollected that in all but three of the 28 fatal cases serious complications are mentioned as present. One would not expect to obtain complete recovery by aspirating the pericardial effusion, when incurable disease of lungs, heart-valves, or other viscera existed. Moreover, I have purposely included in the deaths some cases that have lived several weeks after the aspiration, and, therefore, certainly did not die as a result of the tapping; but as they died during the continuance of symptoms for which the pericardial aspiration was performed, it was deemed proper to place them in the death column. That paracentesis of the pericardium is beginning to take its proper place in practical surgery is evinced by the fact that only a few years ago there appeared to be recorded but one authentic case of the operation in America, while now I have records of no less than twelve instances. Nearly all of these have occurred in the last few years, and, of the twelve, five have recovered and seven have died. This gives a mortality in the American cases of $58\frac{1}{3}$ per cent.

In future the operation will doubtless be attempted at an earlier period of the treatment, and many lives saved that in former years would have been sacrificed by procrastinating timidity.

Table of Cases of Paracentesis of the Pericardium since 1860, *Additional to those Published in Monograph.*

OPERATOR.	Date.	Sex.	Age.	Mode and site of operation.	Recovery.	Death.	Time that patient survived operation.	REMARKS.	Complication.	Reference.
61. McCall Anderson.	1879	M	17	Aspiration. 5th interspace.	1	..	4 mos.	38 ounces serum. Tapped abdomen 3 months later.	Hemoptysis, left pleuritis, ascites.	Glasgow Med. Jour., Sept. 1879, and letter from Reporter.
62. G. M. Staples.	1877	F	9	Aspiration. 6th interspace.	1	..	$2\frac{1}{2}$ yrs	16 ounces serum. Death from cerebral effusion and renal disease (?) $2\frac{1}{2}$ years after. Autopsy showed universal adhesion of pericardium.	Hypertrophy and valvular disease.	N. Y. Med. Record, Feb. 21, '80, p. 212; Transactions Iowa State Med. Society, vol. iv.
63. F. P. Porcher.	1879	F	70	Aspiration.	..	1	27 days.	f℥ij.	Pleuritis of right side, ascites.	Louisville Medical News, Feb. 7, 1880.
64. S. W. Abbott. (of Massachusetts.)	1877	M	25	Aspiration. 4th interspace.	..	1	16 hrs.	125 grams serum tinged with blood.	Acute endocarditis, left pleural effusion.	Letter from operator.
65. Gairdner. (Gemmell.)	1872	M	27	Trocar and pump. 6th interspace.	..	1	1 day.	Few drops bloody serum. Autopsy showed xxi ounces, opening seen in sac which was greatly thickened. Tubercular pericarditis.	Left pleuritis, tubercular pericarditis.	Glasgow Med. Jour., Nov. 1872.
66. Bäumler.	1877	M	20	Aspiration. 5th interspace.	1	..	$7\frac{1}{2}$ mos.	Punctured twice. 300 grams red fluid, 850 cubic centimetres yellow fluid.		Deutsches Archiv für Klinische Medicin, 1879.
67. Kussmaul.	1878	M	21	Aspiration. 5th interspace. (right side.)	1	..	....	Punctured twice. 750 cubic centimetres brownish red fluid; 250 cubic centimetres. The puncture was outside of nipple line on right side, and withdrew fluid from the pleural sac in both instances, though the needle was afterwards thrust into pericardium and the amounts stated drawn off.	Ascites, pleurites.	Id.

NOTE.—Since the reading of this paper, I have found a report of two other cases of paracentesis of the pericardium, originally published by P. Kummell, in the *Berliner klinische Wochenschrift*, November 23, 1880. An abstract of his paper may be seen in the London *Medical Record*, July 15, 1880, p. 279. One case recovered; the other was tapped twice, and died six days after the first operation.

It will be observed by those having access to the literature of the subject, that I have not included all the cases mentioned by Hindenlang in his elaborate article, published during the same month as my book. This is due to the fact that several of the cases, already recorded by me in my monograph, he has attributed to different operators, because he confused the operator with the reporter, or the chief surgeon with the assistant. Allbutt's case (No. 31) was really Teale's, and is so described by me; Moore's (No. 44) should be Gooch's. The two cases described by Hindenlang, as operated upon by Ponroy (No. 32), and by Frémy (No. 34), are really one and the same case; and the history is given in my table as No. 33.

In the present table I have introduced from his article the operations of Bäumler and Kussmaul; and, from the original source, that of Gairdner, which he attributes to Gemmell (No. 37). The case which he ascribes to Löbel (No. 30) I have omitted, because his article and Schmidt's Jahrbücher, from which he evidently obtained it, give no details, and say the operation failed.

Dessault's and Larrey's cases were discarded by me in the very first of my investigations, because they were apparently not instances of pericardial tapping. In like manner Vigla's case (operated on by Roux) was rejected, because the diagnosis was reversed by the incision into the sac, and the patient died from dilated heart, without any reference to the operation.

ON SKIN-GRAFTING, WITH A REPORT OF SOME INTERESTING CASES.

By LAURENCE TURNBULL, M.D.,
PENNSYLVANIA.

HISTORY OF THE OPERATION.

ONE hundred years have passed since the celebrated anatomist, John Hunter, was successful in transplanting the spur of a young chicken from its leg to its comb, as well as into the comb of a second bird, where it lived and grew; and no one made use of this valuable fact until a French surgeon, M. Reverdin, of Paris, in October, 1869, succeeded in transplanting a small portion of skin from one part of a man's body to the granulating surface of a large sore, under which treatment the ulcer healed.

By the aid of time, position, local stimulation, and mechanical support, in healthy individuals, almost every variety of ulcer or granulating sore will heal, or be covered with skin; but in some instances, after weeks, months, and even years of treatment, there comes a time when this healing will cease, in spite of all the most approved efforts on the part of the surgeon and earnest efforts and co-operation of the patient.

The new process of skin-grafting was in the first instance applied to these difficult and chronic sores.

At a later period the process of skin-grafting was extended to supply defective plastic, and other operations where, from contraction of the flap of skin in healing, the parts are not covered, or to prevent contraction, which is so apt to follow deep-seated burns, and prevent great deformity in the act of healing.

Another important application is, where it is necessary to remove cancer, chancroid, lupus, or in syphilitic ulcers on the face, or any exposed part of the body; the skin-graft fills the removed part with smooth tissue, and is often of the utmost importance in its cosmetic effects.

PHYSIOLOGY OF SKIN-GRAFTING.

It has been found, by careful experiments, that by planting cells of healthy epithelium at various points on the granulating surface of a healthy sore, centres for the development of new skin are formed, and by multiplication and extension of these patches a sufficient amount of healthy skin can be cultivated to cover a very large amount of the surface of the body. M. Reverdin asks the question: "Is the growth of skin due to the effect of contact or neighborhood, or is it due to proliferation of the transplanted elements?"

To make this skin-grafting a success, it should include some superficial dermis or rete mucosum, with some of the deep living cells which are found in the epithelial layer which possess conditions for propagation when placed in the natural pabulum, the healthy blood. If these cells continue healthy, they commence soon a process of proliferation, but no fat-cells are to be introduced, nor must there be simply scarfskin, which latter, being formed of horny, flattened scales, without nuclei, is incapable of growth.

Original plan of operating of M. Reverdin.

A small piece of epithelium, including some of the superficial dermis or rete mucosum, is taken from the healthy cutaneous surface on the inside of the arm, thigh, or face, by a fine forceps, and snipped out with a sharp scissors—each part not larger than the size of half a grain of hemp-seed. A small puncture in the raw surface is then made, and the small fragment of skin is carefully and accurately placed in it and protected by adhesive plaster.

Some suggestions in reference to the success of the operation.

The new skin-graft should be kept in position and not interfered with for several days; it should be lightly covered with a layer of cotton-wool and a bandage, for the purpose of maintaining its warmth and vitality.

If the grafts are placed on an ulcer on the extremities, the patient must be kept in bed for a few days.

Mr. Bryant, of Guy's Hospital, lays the graft on the surface of the ulcer, and states that he has not found any difference in the result.

The happy medium is to push the granulations apart and insert the graft, and not to draw blood by the puncture so as to displace the delicate graft.

To facilitate the detachment of pieces of skin, Mr. Bryant has devised an instrument in which the forceps and scissors are combined, and which accomplishes the object at a single movement, and takes away a portion of skin, which is again to be cut in three or four smaller pieces.

Another method, suggested by Dr. J. T. Hodgen, and adopted by Dr. R. J. Levis, one of the surgeons of the Penn. Hospital, consists in penetrating the cuticle with a very delicate sewing-needle, elevating a small point of skin and shaving off the minute elevation and upper stratum of dermis.

The same results can be accomplished by means of a pair of scissors such as are employed for removing a portion of the iris (termed iridectomy scissors) by separating the blades with slight pressure against the skin, and cutting the piece of skin within the blades. Then on the thumb nail it can be cut up in smaller pieces.

What has been the success of skin-grafting.

Of twenty-two carefully watched cases I find that eleven were perfectly successful, eight partial successes, and three were absolute failures. This I consider a very good result, and there are no good reasons why this important and valuable operation should be so much neglected. It is a most simple operation, which any one with care can perform. But we must not expect too much from a few grafts, and must have patience to wait long enough for the results, and employ an abundance of grafts; fifty, seventy-five, or even a hundred will be required if the surface is large, as sometimes only a few will succeed. Yet these few may perform important work by covering the denuded surface and removing a horrid deformity. It must be remembered that skin-grafting, like all surgical operations, is liable to entire failure when every care has been taken; an east wind, or erysipelas, or the system of the patient running down, may prevent the grafts from growing, or sloughing may ensue and cause them all to disappear.

I will not occupy further time with details of ordinary cases, but will select two which are of special interest.

Case VII.[1] on my list is that of an extensive burn, the result of a railroad accident occurring in Indiana in December, 1871. The scalding involved the entire front of the body. On January 12, 1872, the subaxillary, mammary, and submammary regions of both sides presented a healthy surface of granulations, the full depth of the skin having sloughed off. After allowing nature to do all that was possible, there were grafted one dozen points in the granulating surface from the calf of his brother's leg, inserting the grafts nearly one inch apart. Repeated the grafting every second or third day until January 22, when the whole surface except two points was covered with new skin. The number of grafts used was about seventy-five, fifty of which grew; each of them forming an island of skin extending, meeting, and uniting without leaving any mark of union. The grafts were cut of the full depth of the skin and twice the size of a mustard-seed, and, held in a sharp-pointed dressing forceps, were pushed down into the granulations, and the forceps loosened, the granulations closing over and burying the grafts from sight. On the first daily dressing after the insertion, there was no apparent effect. On the second, the granulations at the point were slightly paled. On the third dressing there appeared a slight circular flattened depression four lines in diameter, the granulations forming a ridge around the patch. From the fifth to the sixth dressing these patches took on the appearance of true skin, and at once began spreading, reaching almost one inch in diameter before coalescing. The extension was first by a circle of granulations becoming pale in color, then flattening and taking on the appearance of true skin. When the patient was last seen, Oct. 24, 1872, the skin presented a uniform smooth appearance, there being no deformity nor disposition to contraction of cicatrix so common after such injuries, recovery being complete.

Case XIX. on my list is one of the most remarkable cases on record. The woman was exhibited and the history given me by the surgeon, Dr. I. R. Hayes (at Tralee, Ireland). On May 24th Dr. Hayes was called to see Mrs. S., aged 36, who was found insensible, lying with her head and face on the hearth, where a turf fire had burnt out. The upper part of the cheek and eyelids of the right side were vesicated; the forehead and side of

[1] Indiana Journal of Medicine, July, 1873. Dr. I. M. Green.

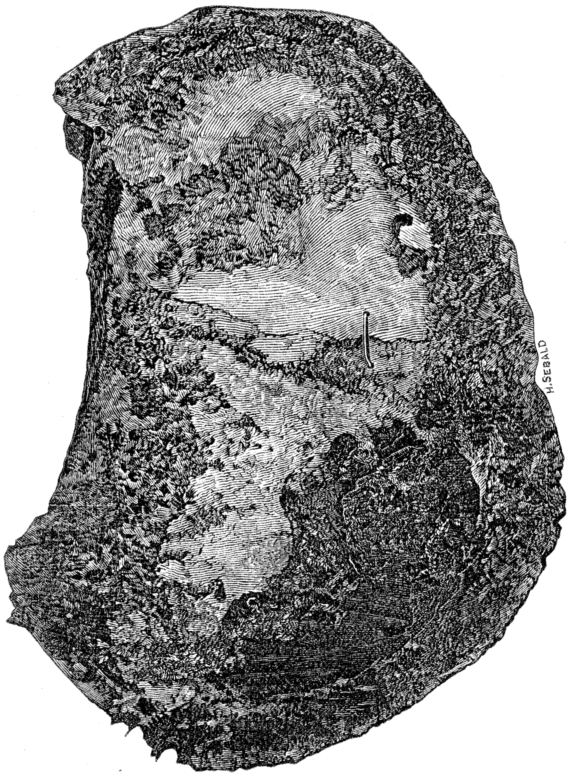
the head also suffered; and a portion of the skin over the parietal bone was charred, as may be seen in Fig. 1. She was quite unconscious, and continued so until the following morning. For three or four days she was greatly depressed, but free from pain.

Fig. 1.

Reaction having set in, she suffered very much from pain and sleeplessness, which was relieved by full doses of opium. She appeared to improve until about the sixteenth day, when suddenly she became slightly delirious, and suffered from nausea and occasional vomiting, with paralysis of the left side. The face was free from the paralysis. These symptoms passed off in ten days, and her health gradually improved. The injured parts of the face, upper part of the ear and eye, which are seen in Fig. 3, had sloughed away and cicatrized, and she was able to go about doing her household work. About October 1st the bones had separated at the sutures in a line extending from the mastoid portion of the temporal to the posterior angle of the parietal, along the lambdoid and sagittal sutures to the superciliary ridge, and outwards to the outer angle of the frontal bone. On

October 3d Dr. Hayes removed the bones, including the whole parietal and half the frontal, as seen in the Figs. 1 and 2. The under surface of the bone was covered with a thick curdy matter. The depressions of the arteries and the honeycombed character of the bone from the suppuration are well seen in Fig. 2, which is a view of the internal surface.

Fig. 2.



No pulsation could be felt over the meningeal arteries, and a quantity of fetid pus welled up from between the hemispheres. The dura mater, which was covered with granulations, continued to secrete pus freely.

Finding the ulcerated surface was not cicatrizing, about December 2d Dr. Hayes grafted skin on five places on the dura mater; three of them were successful and two failed (one was scraped epidermis). The cicatrization commenced from those which took, and ultimately covered the whole of the exposed

surface. Fig. 3 was taken three months after the removal of the bone and one after the grafts were put on, and shows the

Fig. 3.

beautiful progress of the grafting. When the skin-grafts were put on, Dr. Hayes placed a pad of lint over them, and bound it with a strip of adhesive plaster. The following day her left side,

Fig. 4.

including the face, was paralyzed; this continued four days, when the pad was removed, and the symptoms immediately passed away.

Fig. 4 exhibits the appearance of the grafting on December 25th, and shows the rapid progress which it had made up to that time. When I visited the woman with Dr. Hayes at Tralee on August 14, 1879, I found the whole surface of the side of the head was smoothly covered with skin, and the woman had no paralysis and was able to use the arm of the affected side by carrying a heavy basket for a good part of the day; could also knit and sew. The parts were not very sensitive to pressure. She was intelligent and able to answer all questions put to her. The gentlemen who visited Dr. Hayes's residence and had an opportunity of seeing this woman with me, were Mr. Ernest Hart, of London, Dr. Edward Carpenter, of Croydon, near London, Dr. Novel Gueneau de Mussy, Hotel Dieu, Paris, Mr. Nickelson, surgeon, of Hull, Mr. Baker, surgeon, of Derby, and Dr. Mason, ophthalmologist, of Bath, England.

ON THE TREATMENT OF SYPHILIS AT THE COMMENCEMENT AND END OF THE 19TH CENTURY.

By CHARLES R. DRYSDALE, M.D., M.R.C.P., F.R.C.S.E.,

ENGLAND.

Syphilis has been called by one of the greatest writers upon it in the nineteenth century, Dr. T. Ricord, of Paris, "the greatest plague that menaces civilization." How far this may be true, the writer presumes not to pronounce; but, when we take into account the vast numbers of our modern populations that in the very heyday of youth are assailed by that redoubtable virus, we are forced to confess that no disease plays a more important part in modern times. In London, in Paris, and throughout all European cities, syphilis is the cause of hosts of diseases, of greater or less severity; and this in spite of the most strenuous attempts on the part of the medical authorities in modern cities to prevent the spread of and cure it as soon as it exists.

Familiar as I am with Paris and London, I have learned lately to expect but little from government schemes, and it is to the *treatment* of the disease that I have, therefore, recently directed my attention. Marriage, I maintain, will have to become universal, and to be made compatible with those economical laws which govern man's existence on this planet, before much can be done to stamp out syphilis. Let me ask, then, How ought this disease to be treated?

Had I asked this question at the beginning of this century, the reply would have been simple in the extreme. Mercury was at that time the only remedy known, which seemed to have any great influence over the disease.

Shortly after the introduction of syphilis into Europe—which in my opinion took place in 1493, when there landed in Europe the ships of Columbus at Lisbon—mercury began to be tried in syphilis, and soon was used to an enormous extent in all forms

of disease affecting the generative organs. Poor Ulrich von Hutten, one of the martyrs of the palmy days of mercury, relates how he had been salivated eleven times for syphilis. "He was hardly anointed before he began to languish amazingly; and so great was the strength of the ointment, that it forced into the stomach whatever portion of the disease lay in the upper part of the body in so violent a manner as to make the teeth drop out. . . . After all, there was hardly one in a hundred cured by it."

"Mercury," says John Hunter, the celebrated Scottish surgeon, in 1786, "in the lues venerea, as in the chancre, is the real specific; and hardly anything else is to be depended upon." Hunter gave it in gonorrhœa. The consequence of these views is shown in a sentence from Mr. Pearson, surgeon to the London Lock Hospital, who, writing in 1800, says: "If credence may be given to men of eminence in the profession, this rigorous course of discipline is not necessary; for, according to Thierry de Héry, M. de Blegny, and others, the disease may terminate by a natural crisis, and is susceptible of a natural cure. . . No proof can be brought that the powers of the constitution, aided by this sort of discipline, did ever effect the cure of the disease without the intervention of medical assistance."

Such was the state of medical belief as to the influence of mercury in curing syphilis, at the beginning of our century, when Dr. Fergusson, who was chief of the medical forces in Spain, wrote home, in the following terms: "Until our experience in the Peninsular wars, there had been but one opinion among us, as to the utter incurability of syphilis but by mercury; and if, by chance, the disease got well without it, we had as little hesitation in declaring that it could not possibly have been syphilis, but some other disease putting on its form. . . . I confess that nothing in the practice of medicine ever staggered me more than the discovery (made by him in Spain, when syphilis was not treated by mercury) that the creed of ages should be found utterly baseless; that the wisest among us should have, in all the intermediate time, been destroying, instead of saving, their patients, by murderous and unnecessary doses of mercury, was enough to shake the firmest faith in physic."

Dr. Fergusson's views were carried out by Mr. Rose, 1817; Mr. Guthrie, 1817; Dr. John Thompson, 1818; Dr. Hennen, 1818; Dr. Desruelles, Val-de-Grace, 1828; Dr. Fricke, of Hamburg,

1828; and afterwards by a commission established by the Swedish government, with the result that it was clearly seen that a large number of cases of syphilis tend to spontaneous cure.

About the year 1838 M. Ricord began to write upon venereal diseases; but two years before that one of the greatest discoveries ever made in practical medicine was made at Dublin by Mr. Wallace, who experimented on the treatment of syphilis with iodine, and who definitively introduced the treatment by iodide of potassium in 1836.[1] He there gives the results of treatment of 139 patients, of whom six had iritis; six, affections of the testicles; ten, diseases of the bones; ninety-seven had syphilitic skin affections; and twenty had mucous tubercles. Adults took thirty grains of the iodide in the twenty-four hours. Wallace's experiments commenced in 1842.

Ricord[2] admits that hard sores heal without mercury, and treats the later symptoms (tertiary) with iodide of potassium; but gave for many years a six months' course of mercury of about one or two grains of the iodide (protoiodide) of mercury in the twenty-four hours, as soon as the diagnosis of syphilis was made. In Paris the school of Ricord has maintained his practice. In Edinburgh the tenets of Dr. John Thomson and his illustrious pupil, Professor Syme, almost banished mercury from the therapeutics of syphilis for a long time. In London, compromise has been the practice of the profession. In Christiania, Professor Bœck was a bitter opponent of mercury. In Germany, Berlin was mercurial, and Vienna less so.

Thus had professional opinion halted between different contradictory views, when Diday, in 1863, wrote his work on the "natural history of syphilis." This was followed by several works on the same subject in London and elsewhere. In 1867 a very important discussion took place in the Société de Chirurgie of Paris, in which MM. Dolbeau, Perrin, Deprés, etc., took the non-mercurial side, recommending, in place of mercury, iodide of potassium and the external treatment of mucous tubercles; whilst Dr. Diday, of Lyons, was eclectic, and the mercurial side was maintained by MM. Lefort, Verneuil, Velpeau, Depaul, and Panas.

At this time, in 1880, the mercurial treatment of true syphilis is the ruling treatment in London and Paris. In the latter city

[1] The Lancet, 1836.

[2] Lettres sur la syphilis.

M. Fournier recommended a long course of intermittent doses of mercury at the onset of the disease, during *two years*, to ward off tertiary symptoms, and to mitigate the severity of the eruptive period; and Mr. Jonathan Hutchinson, in London, is a strong and decided mercurialist; believing firmly that mercury can occasionally ward off all secondary rash when given for hard sore, and recommending it for an uncertain period in the eruptive period.

Lancereaux, on the other hand, does not believe that mercury prevents the occurrence of tertiary syphilis, and mentions that the favorite remedy of Ricord and the Parisian school is extremely prone to cause salivation. For my own part, I claim a right to take a part in the discussion, in that I have endeavored for many years past to study syphilis both without and with the interference of mercury. For some years I carried out the non-mercurial treatment, treating patients with hard sores or secondary eruption with iodine, in the form of small doses of the tincture or of iodide of potassium. What I found was, that iritis occasionally supervened—perhaps in two per cent. of the cases; but that that lesion usually did well when treated by blisters, belladonna, and fomentations: that hard sores always healed in a short time without any internal medication being required: that secondary eruptions gradually faded, and in many cases seemed to be benefited—contrary to general opinion—by iodide of potassium; whilst, on the other hand, I found tertiary symptoms, such as sarcocele, cerebro-spinal syphilis, etc., to occur in a certain indeterminate number of cases treated simply by iodine.

Moved by this latter fact, and the powerful allegations of my respected friends, M. Fournier and Mr. Jonathan Hutchinson, I have for the past three years treated all cases of primary and secondary syphilis by small doses of mercury, setting out from the theory (of Hutchinson), that in syphilis there is present some parasite in the blood and tissues, of low vitality, which can be acted on by small doses of mercury or iodine, just as these substances have the power to destroy the fungus of ringworm, when locally applied.

My patients have been usually young women under the age of twenty-five, the occupants of the Rescue Society's Hospital at London. I have used no form of mercury with these girls but the green iodide. At first I gave one-third of a grain twice

daily; but my experience showed me soon that even that small dose not unfrequently caused salivation in the course of a month or so of daily treatment. I have, therefore, thought it advisable to give a smaller dose than two-thirds of a grain of the proto-iodide of mercury daily, and have, therefore, given latterly one-sixth of a grain of that salt in combination with two grains of extract of henbane in a pill, twice daily, to these young female patients.

This dose seems to be well tolerated, and not to produce salivation, even when continued for months. I have given it, with occasional interruptions, for twelve months, without any clear symptoms of mercurial poisoning appearing.

Under this treatment, the disease goes on in general in a favorable manner. For the most part, the secondary eruptions are benignant, accompanied, occasionally, by slight alopecia and mucous tubercles, which latter symptoms are amenable to local treatment by means of chlorine lotions and isolation. Iritis has occurred about as often as when I did not use mercury, and has usually been very amenable to belladonna and blisters. One or two cases of rupia have occurred, but have, with one exception, done well. No severe cases of sore throat have been seen. There have been cases of apparent rectal syphilis which have proved obstinate, and in one case the prognosis was bad. As far as I have followed the patients, there have been but few cases of tertiary disease seen; but I am fully aware that it is impossible to foretell when such symptoms may arise, since syphilis arises after twenty years. I conclude—

1. The initial lesion requires no mercury.

2. Syphilis, when iodine is used without mercury, is usually mild.

3. Syphilis, when treated with very small doses of iodide of mercury, is usually mild.

4. Iritis supervenes whilst patients are taking courses of mercury, and is usually amenable to blisters and atropine.

5. Tertiary syphilis is rare after iodide of potassium and iodide of mercury.

6. It is best treated by large doses of iodide of potassium, adding mercury when that remedy fails.

7. Cerebro-spinal syphilis supervenes in some cases early in the disease, and we may then give both specifics, or iodide of

potassium alone, which holds good also in syphilis of the testis, liver, or lung.

8. Mercury and iodine probably act by their power of destroying the low vegetable organism in the tissues—*the yeast of syphilis* (Hutchinson).

9 The dose of mercury ought to be very small.

TREATMENT OF FRACTURES OF LONG BONES INVOLVING JOINTS.

By JAMES S. GREEN, M.D.,

NEW JERSEY.

DURING the winter of 1875 and 1876, it was my privilege to follow closely the private and clinical practice of Professor Lewis A. Sayre, and during that time and afterwards, had the opportunity of witnessing him perform a number of operations for fibrous anchylosis of the knee and hip-joints, from which experience I gathered the principle, which I afterwards applied in the treatment of fractures involving joints.

The joints to which I applied this treatment were the elbow and ankle-joints, being the articulations which have suffered more frequently than any other joints from injury, and the mode of treatment laid down in the principal works on surgery with the exception perhaps of the radio-carpal articulation.

During the first years of my surgical practice I had, on more than one occasion, realized the truth that the most careful application of the following direction laid down in the text-books for the treatment of a fracture involving the elbow-joint, yielded me an imperfect result.

"Bend the forearm at a right angle to the arm, draw it forward until the parts be brought into their proper places, and into apposition, and preserve them in this condition by applying a few turns of roller round the lower part of the arm and upper part of the forearm. An angular splint is then to be applied behind the arm or forearm of wood, leather, or gutta percha, with a smaller straight one in front, fastened by a bandage lightly applied; with evaporating lotions and other antiphlogistic measures to be used as the case demands." . . . .

"Passive motion is to be commenced in two or three weeks, according to the age of the patient." Notwithstanding my strict observation of the rules above given, and passive motion

being commenced within six days, in a case of fracture of both condyles of the humerus, my experience is best expressed in the words of Mr. Wm. H. Flower[1] in his article "On Injuries of the Upper Extremity." "The remaining fractures of the lower end of the humerus are of a more serious character, as they are necessarily attended with more or less inflammation of the joint, and are consequently almost always followed by some permanent impairment of the movements of the elbow."

Strange as it may seem, and it has appeared passing strange to me, in the standard works on surgery no means have been recommended that will prevent this almost certain "*traumatic synovitis*," and its consequences of "some permanent impairment in the movements of the elbow."

Dr. Sayre's treatment of the joints upon which he had used "brisement force," had so invariably prevented subsequent traumatic synovitis, that I determined to apply it to the first case of fracture involving the elbow-joint which came under my care. But before detailing the cases in which the principle involved was successfully used, I will quote from Dr. Sayre's work on "Orthopædic Surgery and Diseases of Joints," in which he states the principle alluded to above (page 215). In speaking of the dressing of a knee-joint after "brisement force," in January, 1854, he writes: "A tight roller was applied from the toes up to near the knee; a large sponge placed in the popliteal space, and strips of adhesive plaster were applied over the sponge and drawn tightly around the joint from the bandage below the knee to some six inches above it. The roller was then continued over the plaster snugly applied to the whole thigh. A piece of sponge about two inches in length and about the size of the forefinger, having been placed over the track of the femoral artery—as is my usual custom in this operation—the roller was carefully applied to cause partial occlusion of the calibre of the artery, and thus diminish the supply of blood to the joint without being so tight as to induce its complete strangulation." . . . "I wish to call especial attention to the principle involved in the dressing in this case, as I think it of cardinal importance, having witnessed its practical benefit in many serious operations. *I mean the pressure on the main trunk of an artery leading to any part in danger of inflammation in such*

[1] Holmes's System of Surgery, vol. ii. p. 544.

manner as to diminish the supply of blood, to prevent inflammation by partial starvation. Great caution is of course necessary not to produce gangrene, but little practice and close observation will soon give the necessary tact of knowing how to *use* pressure without *abusing* it."

In following out this plan in the treatment of fractures involving joints, I determined to incase the whole limb, from its lower extremities to a point at least six inches above the joint involved, in a snugly-fitting plaster-of-Paris bandage (provided the case of fracture was seen before swelling occurred), believing that the plaster bandage properly applied would prevent the swelling in the joint, and influx of blood to the part in sufficient quantity to allow a traumatic synovitis to be set up.

Case I.—On the 26th of June, 1876, the first opportunity presented itself in the person of H. H. I., aged twelve years, who, falling from a high fence, produced a T-shaped fracture of the humerus and a dislocation of the forearm backward.

I saw the patient within an hour of the accident, and, having fully anæsthetized him, was able to reduce the dislocation and place the bones in perfect apposition. The arm and forearm were fixed at a right angle, and a snug-fitting plaster-of-Paris bandage was applied to the limb, from the fingers to the axilla. This dressing was watched carefully for the first five days, and as there were no indications requiring its removal, it was allowed to remain until the morning of the sixth day, when the mould was cut down along the front of the arm, and the cast carefully removed for the inspection and passive motion of the joint. To my great pleasure I found that the treatment had prevented traumatic synovitis, that the fragments were in proper position, and having moved the joints carefully I returned the arm to the splint. The cast was removed, and passive motion used daily for four weeks, when union was complete and the joint perfect in form and motion.

Case II.—May 25, 1877, C. K., aged fourteen years, fell from a tree, fracturing the external condyle of the humerus, with displacement of the head of the radius. Saw patient immediately after the accident. The same treatment was followed by a perfect result, as in the former case.

Case III.—November 15, 1877. G. K., aged twelve years, fell from the back part of a wagon while in motion, and fractured both condyles of the left humerus, dislocating the forearm

backward. Saw patient in a few moments after the injury. The same plan of treatment was pursued, as in the former case, with union and perfect joint in five weeks.

Case IV.—August 10, 1878. Henry V., aged twenty-two, while playing base ball was thrown violently to the ground, fracturing the internal condyle of the right humerus. Saw patient within an hour of the accident, and although there was slight swelling I used a plaster-of-Paris bandage snugly applied. This case gave me more uneasiness than the others above mentioned, as there was considerable pain in the hand, followed by a numbness of the fingers; but careful inspection satisfied me that the arterial supply was sufficient, and the cast was not removed until the fifth day, after which the same plan of removal and replacement of the splint after passive motion was followed, as in the other cases, with a perfect result at the end of six weeks.

Case V.—July 15, 1879. John F., aged thirty-three, farmer, was injured by the wheel of a heavily loaded wagon passing over his left ankle. Saw patient within fifteen minutes of the accident. Easily diagnosed fracture of the lower ends of the tibia and fibula with dislocation of the foot outward. Anæsthetized the patient, replaced the bones and foot, applied a plaster-of-Paris bandage on the limb to the knee-joint, made moderate pressure at the popliteal space with a dry sponge subsequently wet with warm water, elevated the foot, and gave a full dose of morphine. I watched this case most closely for five days, and, although the patient seemed at times to be uncomfortable, I did not think that his symptoms demanded my interference, and did not remove the cast until the sixth day, when I was gratified to find the use of the plaster bandage most satisfactory, and with daily removal and passive motion the case progressed with perfect result. The notes of Case No. 6 are from the practice of Dr. Alonzo Petit, of Elizabeth, who assisted me in the treatment of Cases No. 1, No. 2, and No. 3.

Case VI.—H. W. J., aged 36 years, Dec. 27, 1878, by a fall from a ladder, received a compound comminuted fracture of the left leg, the tibia being broken obliquely about an inch and a half above the ankle-joint, a second fracture extending through the lower fragment into the ankle joint, so that the internal malleolus was loose and movable. The lower end of the upper fragment had penetrated the flesh and skin, making an irregu-

lar wound one and one-quarter inches in extent, severing a small artery, from which there was considerable hemorrhage. The fibula was broken about two inches above its lower extremity. Assisted by Dr. Victor Mravlag, a plaster-Paris bandage was at once applied, extending from the toes to the bend of the knee, and as soon as it had set, an opening was made through it, opposite the wound, and firm pressure kept up by a compress of oakum and a roll of bandage, which readily controlled the hemorrhage; the case was carefully watched, the circulation in the toes continued good, and the swelling was very slight; six days after the accident, the plaster cast was divided, a portion of the edges removed, to make the splint smaller, and reapplied to the limb.

January 29, 1879, the wound having healed thoroughly, a new plaster bandage was applied. February 4 the splint was removed; union perfect, with a good joint. Patient wore splint two weeks longer, removing it daily for exercise of the joint, after which time recovery was complete, all the motions of the joint perfect, and no lameness in walking.

In reciting these cases, and reviewing the results, I lay no claim to any originality in the *immediate dressing* of fractures with plaster-of-Paris bandage, for I well recollect the report of a clinical lecture by Dr. David W. Yandell, published in *The American Practitioner*, July, 1876, in which the use of immediate dressing of fractures by this means is fully advocated and defended. In this admirable lecture, in opposition to the generally established rule of *waiting until swelling* and *inflammation have subsided*, he lays down the following axioms: In answer to the question, "What was the best time to put up such fractures" (referring to a fracture of the leg), his answer, "*The earliest possible moment after the bone was broken;* the sooner the better," and then adds, "*Dress the fracture, if you can, on the spot.*" "The early application of the dressing had most certainly prevented swelling. In proof of this, I need only refer you to my own experience in its use, and state that, in all cases in which I have applied it, *I have never had occasion to remove it on account of swelling in a single one.*" . . . "A limb timely put up in the plastic apparatus will not swell."

But I do claim that the universal language of surgical authority, since the times of Dessault and Sir Astley Cooper, has

remained unchanged, with regard to the proper treatment for fractures involving the elbow-joint, except in one respect, in which Dr. Frank Hamilton and Dr. I. F. Dorsey recommend that passive motion be commenced at the end of the first week instead of at the end of the third week, as directed by Sir Astley Cooper. "Considerable swelling is almost certain to follow." . . . "Within seven days, and perhaps earlier, passive motion must be commenced;" . . . "it is better not to resume the use of splints after this period;"[1] and in Dr. John Syng Dorsey's work[2] we find the following: "After a week has elapsed, the dressings are to be removed, and the joint carefully and gently flexed and extended several times, to prevent stiffness, after which they are to be carefully reapplied, and this is to be repeated once in every forty-eight hours, increasing (as the cure advances) the motion of the joint." I also claim that the treatment universally laid down by the authorities on surgery in the hands of the average practitioner, during the past century, has produced so many cases of imperfect cure and "permanent impairment in the movements of the elbow," that fractures involving this joint have become an opprobrium in surgery.

That the prevention of traumatic synovitis, by properly applied pressure to the injured limb, as demonstrated by Dr. Sayre, in his work on *Orthopædic Surgery*, will remove ("if properly *used*, and not *abused*") impaired motion, fibrous anchylosis, and deformity, as factors in the bad results heretofore obtained in fractures involving joints. I do not intend in this paper to attempt to demonstrate how this plan of treatment prevents *traumatic synovitis*, whether by direct pressure upon the arterial supply of the joint producing "partial starvation," as stated by Dr. Sayre; or to answer his objectors, who claim that pressure on the artery sufficient to produce a diminished supply of blood to the joint, would also impede seriously the venous return; or to adopt the theory of others, who would explain the result of this plan of treatment by insisting that the immediate immovable dressing secures absolute rest and uniform pressure upon all the parts surrounding the injured limb, thereby inducing a perfect return of blood by the support given to the venous capillaries of the tissue about the affected joint, and in this way preventing dilatation

[1] Hamilton on Fractures and Dislocations, p. 263.
[2] The Elements of Surgery, vol. i. p. 158, year 1818.

of the capillaries, the stasis of blood in them, consequent inflammation, and swelling: but I simply wish to put *the fact* on record *that treatment of fractures of long bones involving joints, by immediate plaster-of-Paris bandage before swelling occurs, yields a perfect result if carefully and judiciously used, when its employment is supplemented on the sixth day by passive motion and reapplication of splint daily.*

As the treatment recommended by me in the cases above mentioned was applied before swelling and infiltration of the tissues in and about the joints had taken place, the question will naturally arise, what is to be done for those cases which are not seen soon enough to warrant the use of a close plaster-of-Paris bandage when swelling of the joint has occurred? I reply that I would treat the joint on the same principle as in any other synovitis, namely by *rest*, *extension*, *fixation*, *elastic pressure*, *and the application of cold.*

This will be accomplished by bandaging the limb snugly from the lower extremity to within six inches of the affected joint with a flannel bandage, then by the application of the "section splint" as devised by Dr. Charles F. Stillman, to the limb, placing the arm and the forearm at a right angle, and making the necessary extension in this position. The splint being applied I would then form a many tailed bandage of Scultetus from strips of India rubber sheets (known to dentists as "rubber dam"), and firmly and thoroughly encircle all the space between "the terminal plates of copper" which hold the splint to arm and forearm. Ice-bags can then be applied without difficulty to the joint which, while it is held absolutely still, is pressed firmly and continuously as the swelling reduces.

When the active symptoms have subsided, the elastic bandage being removed, the fragments can be examined and properly adjusted, and the elastic bandage reapplied. Passive motion can now at any time and to any degree (as may be deemed advisable) be used, loosening the clamps which fasten the slotted sector, and the limbs again put at rest, by securing them after passive motion.

By this mode of treatment the swelling or traumatic synovitis, which may be commenced in an elbow or ankle-joint by a fracture, can be successfully combated, and after this complication is at an end the joint is an instrument in which it can be critically observed, adjusted, and moved until the fragments have united, and perfect motion been assured.

SOME POINTS IN THE TREATMENT OF HEMORRHOIDS.

By WILLIAM R. D. BLACKWOOD, M.D.,
PENNSYLVANIA.

In briefly considering this subject, I do not hesitate to assert at the outset that, aside from the actual suffering endured, no chronic malady causes more loss of time and money to its victims than the one under consideration; and when we remember the fact that many thousands are afflicted with hemorrhoids, the importance of the matter is readily apparent. It is unnecessary to refer to anatomical or pathological questions; these have already been thoroughly discussed, and are understood by all practical surgeons. Piles are simply local anal tumors, varicose in nature, lying either or both within and without the sphincter, liable to inflame or ulcer at intervals, caused by either local irritation or venous obstruction at points more or less remote, disorders of the hepatic system of vessels being notably productive factors. A "fit of piles," as the laity term the acute inflammatory action which sets in at intervals, is accompanied by general febrile disturbance, together with prostatic, vesical, and gastric irritability in the male, and in the female the bladder symptoms are frequently exchanged for serious uterine complications. Pregnancy, which frequently produces hemorrhoids, may be terminated through abortion, induced by acute inflammation of piles, especially in the case of those long affected.

The principal agents productive of hemorrhoids are errors in the digestive function, through inattention to diet, neglect to secure a full, free, and daily alvine evacuation, or the production of harsh cathartic action in constipated persons through aloetic purgatives especially; the vaunted use of aloes in the treatment of piles, as lately advocated, to the contrary notwithstanding. Onanism, and certain methods of generaic fraud, especially tend

to the production of hemorrhoids in both sexes, and aggravate the condition existing. Every successive "fit" increases the trouble already present, and ulceration is intensified, thus increasing the liability to hemorrhage. I am not a believer in pathological safety-valves or drains, and unless in the case of typical gormandizers, who must bleed or burst—and for them this is as convenient an outlet as any other—I always interfere, when hemorrhage becomes free, or repeated at short intervals; and I may here state that I have operated under very diverse conditions, both for hemorrhoids and fistula, and have never seen anything but good result, in spite of the popular notion respecting the danger of so doing during the coexistence of pulmonary and other complaints.

The first point in the medical management of a case is strict attention to diet. We extend our gastronomic performances too much in this country, and the national virtue of getting away with our meals at break-neck speed is proverbial, especially in our travelling public, whom necessity compels to eat too often bad food villanously cooked, eating-house biscuits particularly, being beyond even the power of an ostrich to digest, as no doubt many of my hearers know from personal experience. It has been said by some Solon that "every man should be his own doctor at forty;" and, in my opinion, all men should, if they deserve to live at all, know what diet suits them at half that age, and adhere to it. As few persons, however, attend to this matter, it behooves the physician to carefully watch his hemorrhoidal patients in this respect. Fruit should enter largely into the dietary, and I have found excellent results follow the habitual, daily use of at least a pint of the juice of the ordinary tomato, and it should preferably be uncooked. This esculent can be readily preserved throughout the year in any of the numerous air-tight cans or jars in common use. In lieu of baker's or home-made white wheat bread, Graham, oaten, or bran bread and crackers should be taken, and a bowl of gruel made from either oat or Indian meal is valuable at bedtime in constipated habits. Instead of common salt, the addition of a few grains of sodium phosphate acts happily. All alcoholic, malt, or other liquors, from the strongest to the mildest, including home-made beverages, must be strenuously tabooed, and many sufferers are greatly relieved simply through abstinence in this direction, venous congestion of the hepatic system being often unconsciously maintained through

moderate indulgence in drinking. Regularity in eating is essential; better miss the meal than partake an hour too soon or too late. Next to diet, but not less important, is the necessity of a full, free, and daily evacuation of the colon and rectum, preferably before commencing the duties of the day. As in everything else, habit has much to do with this, and the bowel can, in the majority of cases, be educated to unload itself without medication. On rising from bed or breakfast, gentle massage of the abdomen, having first bathed it rapidly with fresh cold water, and dried by thorough friction with a rough towel, will in a short time so tone the muscles of the parietes and the bowel as to compel action, even in obstinate constipation. I have repeatedly relieved this miserable condition by this simple process without a solitary dose of any medicine. The application of induction currents from a good Faradic battery replaces massage, but must be kept in the hands of the physician, as injudicious or too powerful currents over the solar plexus of the sympathetic will frequently induce faintness and depression. If medication must be used, or obstinate hepatic torpidity persist, an admirable combination is one minim (.066 c. c.) each of ext. fl. euonymin, iridin, and tr. belladonna, with or without strychnia. This may at times be replaced by similar small doses of Fowler's solution, fl. ext. phytolacca, and tr. belladonna, and whichever is used should be repeated four times daily. Fluid preparations are preferable because of their reliability and facility of absorption. To obtain good results, the administration must be maintained for several weeks, or until the case is evidently in need of surgical interference. The use of ergot and glycerine internally has been negative with me. An enema of lukewarm water before defecation is valuable in ulcerated cases, and water mopped on as hot as bearable after a motion will relieve the hemorrhage, if severe. *Paper of any kind should never be used in the closet*, but in place thereof, a soft sponge, with carbolated water, should be freely applied to cleanse the mass before replacing it inside the sphincter. *This point is exceedingly important*, and should be insisted on by the attendant. All supporters, ointments, suppositories, and the like local applications have utterly failed in my practice, and I have tried many highly lauded.

A faithful trial of such medical treatment failing, operative measures should at once be instituted. My plan is, to urge

operation after the first well-defined "fit," or acute inflammatory attack, for no one knows how soon the next, and possibly severe one, may ensue. I also snip off all external piles, or shrunken tabs, as soon as discovered, to prevent transfer of the irritation to which they are peculiarly exposed to coexisting internal hemorrhoids. For many years my operative measures were confined to the ligature, nitric acid, and the galvano-cautery, but for the last three years I have used exclusively in all cases pure crystallized carbolic acid, enough glycerine only being added to insure fluidity. With this the masses are injected—two at a time if small, one only if large. In very large tumors the acid is deposited in two or more points without entirely withdrawing the needle, and the body of the pile is injected alone, it being insensitive, whilst the base or neck is the reverse. Strong solutions mummify the tumor at once, whilst dilute solutions are absorbed more or less, as evidenced by the taste in the patient's mouth. The stronger acid is therefore the better, as avoiding probable depression through absorption. Morphia may be added or used subsequently to the injection; anæsthesia is not necessary. The injection should be made slowly, complete rest enjoined, solubility of the bowel insured, light diet allowed, and the cure is assured without danger, which is more than can be said of any other method.

During the last twenty years my experience has been large, and my deductions are based entirely upon practical results, not upon theory. I am convinced that the subject does not receive the attention it deserves, and with a desire to attract more attention to it, and to summarize in closing, the following points are suggested:—

1. Hemorrhoids may be arrested by proper attention to diet, and to a normal daily evacuation of the bowel.

2. Hemorrhoids, being present, may be generally kept in check, frequently greatly relieved, and sometimes cured entirely, by the means used to prevent them.

3. Hemorrhoids becoming troublesome, despite medical treatment, should be removed surgically without delay.

4. Hemorrhoids may be quickly, surely, and safely removed by the preferable operation of injection by carbolic acid.

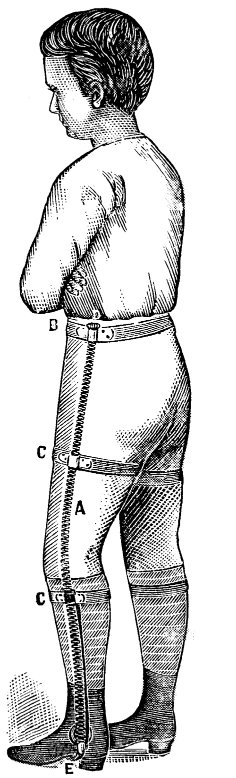
A NEW APPLIANCE FOR THE TREATMENT OF CLUB FOOT AND OTHER DEFORMITIES.

BY GREGORY DOYLE,

NEW YORK.

TENOTOMY properly performed will, in most cases, fully restore the different forms of talipes to the normal condition, so that the foot and limb may be held in the proper position by the hand, or some other retaining power, but as surgeons know there is a constant tendency, especially in talipes equino varus, to rotation inwards not only of the foot but of the entire limb from the hip downwards, and this latter deformity is almost, if not quite, as unsightly as the original trouble. To overcome this difficulty I have devised an appliance which I to-day bring before the Association.

Fig. 1.



A. Spiral steel spring. *B.* Belt around the hips. *C.* Loops to hold spring in place. *D.* Set screw by which tension is regulated. *E.* Plate by which the spring is fastened to the shoe.

Fig. 1 illustrates the principles on which it is constructed, and represents the subject dressed in wrapper and drawers. The instrument is to be worn under the outer clothing.

You will perceive it consists mainly of a pelvic belt, ankle brace, and spiral steel spring, to the lower end of which latter a shoe is attached. The instrument is applied by first fastening the belt around the pelvis. If the foot rotate inwards, the lower end of the instrument is to be twisted or rotated *inwards*, which being done the foot is fastened in the shoe. This will have a tendency to rotate the foot *outwards*. One or more inward turns of the shoe, as the case may require, can be given, and if a nicer adjustment be required, it can be accomplished by a set screw at the top of the spiral spring.

This appliance has been in practical use for the past three months. I first used it on March last, on a little fellow two years of age. I operated on this child when it was nine months old for an aggravated case of talipes equino varus in both feet. After dividing subcutaneously all the contracted tendons and fascia, I had the pleasure of placing his feet in their normal position, and holding them there by means of adhesive plasters, bandages, etc. I congratulated myself on what I considered a complete success, which it proved to be, so far as the operation was concerned. I had restored the feet and retained them in a proper position so long as I used the adhesive straps, but the moment these were dispensed with both feet became inverted, so much so, that they assumed a position at right angles with the normal. A few weeks later when the little fellow attempted to walk, he could place the soles of his feet on the ground, but the above-mentioned diversion was persistent. I applied this instrument and was more than pleased with the result. The feet could be everted at any desired angle without the least discomfort to the child. With it he can walk, run, sit down, or, in fact, get into any conceivable position with the utmost ease.

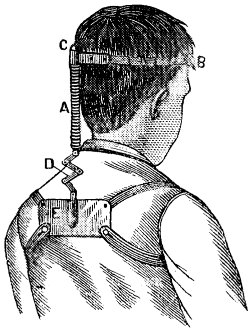
You will perceive that this steel spiral spring is light and very flexible and elastic, resembling in its latter quality muscular action. It holds the foot and limb in a normal position, but not rigidly. With it the patient can exercise his will-power, and rotate the foot outwards or inwards at pleasure, thereby allowing all the muscles their proper amount of exercise. It, however, constantly acts as a watchful monitor, guarding with zealous care the wants of the weakened or paralyzed muscles. It has no joints, but is flexible in any and every part of its entire length. It acts equally well with the patient sitting or standing.

It seems to be overlooked by many surgeons, that in a great majority of cases of inverted feet the entire limb is inverted, rotation taking place in the acetabulum. This is a result of partial paralysis of the abductor muscles. Many have wasted their time in trying to effect eversion with appliances wholly below the knee, and have had as much success as the man who tried to lift himself by his boot-straps.

The uses to which the spiral spring may be put are numerous. In cases of wry neck or torticollis great benefit, espe-

cially in the young, may be derived from it. Fig. 2 fully illustrates it.

Fig. 2.



A. Spiral steel spring. *B*. Strap around the head. *C*. Set screw by which tension to the right or left can be regulated. *D*. Joints which allow an antero-posterior motion of the head. *E*. Back plate to which lower end of the joints is firmly fastened.

In fracture of the neck of the femur, rotation inward may be steadily and constantly maintained by the use of this instrument.

In the different stages of hip-disease good results will follow a proper application of the spiral spring rotation power.

No doubt a further and more extended use of this instrument will develop a larger sphere of usefulness for it.

A METHOD OF TREATING SPINAL DISEASE.

By E. H. COOVER, M.D.,
PENNSYLVANIA.

THE inception of spinal disease and curvature seldom attracts our attention until some reflex action has taken place demanding aid. Recently the subject has attracted notice through the energy and skill of Drs. J. K. Mitchell, Benjamin Lee, of Philadelphia, and Drs. Jacob A. Wood, Taylor, and L. A. Sayre, of New York, all of these making effort toward suspension by some means between the *ilii* and occipito-vertebral articulation, and to secure some mechanical support or splint to retain the proper position. The various kinds of injury and disease, including malformation, to which the spine is liable, form a subject of the greatest practical importance, not only on account of the frequency of their occurrence, but the influence they exercise upon the functions of the body, particularly the nervous system. The study, therefore, of these maladies, with the agencies employed to remedy them, is one of great interest to the general practitioner.

It is with this view that my mite is added to the store of knowledge upon this subject, inviting your attention to a description of the construction and advantage of a new mechanical appliance with corset facilities for their treatment.

The spinal column, as the seat of disease, is repeatedly overlooked because the symptoms arising from it are of a nature slow and insidious, leading one to suspect organic derangement when the real place of trouble is in the vertebra. Weeks, months, and even years pass away before they become known. One may fall, striking some hard body, or jump from a height alighting on his feet or nates, leaving no apparent injury beyond a feeling of having been well shaken up. After a time a failure of nervous power ensues, and at a later period more definite symptoms develop.

The details of the causes, symptoms, or injuries, and their discussion are unnecessary here, nor should any attempt be made to detract from the several modes used and recommended by recognized authorities.

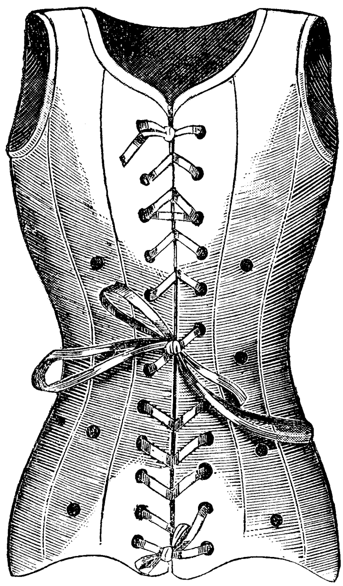
In my opinion rest, absolute rest, is essential to any probability of recovery from an injury or disease affecting the spine, and that rest can be properly secured only by means of a mechanical appliance which will give uniform support to the anatomical structures.

It is not claimed that the use of silicate of soda is *original*; for it has been used for years as a fixed dressing, *but* the application of it to the manufacture of a spinal jacket, with some peculiar mechanical contrivance, seems of the utmost importance when the bony system is contemplated and the point of support considered. The process employed by me enables one to easily adapt it to particular cases because it is an open corset.

It is as follows: from unbleached muslin are cut four pieces shaped like the front and back of a coat or bodice, and long enough to reach below the pubes and hip-joint. The patient being clothed in a skin-fitting, seamless garment, and seated upon a stool somewhat higher than an ordinary chair, the front pieces are laid on and wetted with a solution of silicate of soda, specific gravity 1.2755 in summer, and a little higher in winter. The back pieces are next put in place, the top and bottom edges are laid carefully together, the intervening edges being cut purposely to show an eliptical opening. This is done for the reason that, when the pieces are pressed to place, the edges will meet without overlapping, thus making the jacket conform to the natural curve of the back; after which a bandage, three or four inches wide, is passed around the body, from a point immediately under the axilla to the hip-joint, or below that point if you wish to extend the support lower down; this may be required in some forms of lateral curvature. This fixes the body pieces, and secures a firmer structure upon which to build the more substantial part of the apparatus, besides obliging the jacket to conform more strictly to the natural curve of the body of the individual. Each turn of the bandage should lap one-third, and be wetted with the solution of silicated soda, with a brush in the hands of an assistant. Care should be taken to avoid wrinkes or folds left in the bandage; it is better to cut the muslin. (Fig. 1.)

Braces of tin, slit at short intervals along their entire length, and about one inch from the edge toward the centre, like a many-tailed bandage, in order to make them more flexible in adjusting, three or four inches wide at top, and five or six inches at bottom, reaching from near the axilla to a point beyond the crest of the ilium, and partly to the rear of the hip-joint, are next placed in position, bent to meet the natural curve of the body, and covered with muslin wet with the silicated solution. I would here draw your attention more particularly to the position of these braces. The one on the left

Fig. 1.



side of the jacket before you shows the brace as resting upon the crest of the ilium, bearing the weight of the thorax and upper extremities of the body. Much inconvenience and uneasiness are occasioned by the jacket with the brace in this position. For weeks, and even months, particularly in spare persons, the patient is compelled to lift it up and out of place, thereby defeating the object intended. But when the brace is placed partly to the rear of the crest of the ilium, as is shown on the right side of the jacket, the weight is carried by the *glutei* muscles, they being large form a cushion for the brace to rest upon, and are largely concerned in the station and progres-

sion of the lower extremities, carrying the weight without the least inconvenience to the patient. Other braces of tin, an inch wide, and extending from the junction of the fourth rib with the os sternum to a point near the symphysis pubis, are placed, leaving a space of about two inches on each side of the median line, where the jacket will be cut for the purposes of eyeletting. Still another brace of tin, one or one and a half inch wide, is placed along the spine, shaping it also to meet the contour of the parts. Should there be posterior curvature, and some of the spinous processes extend out more than natural, it is better to lay two narrow strips of tin, one on each side of the prominent vertebræ, for the reason that the diseased structures will not tolerate any undue pressure. Now, a bandage similar in dimension to the one alluded to prior to applying the braces, being saturated, as it advances, with the silicated solution, the patient is now extended (was on a stool before) by some suitable apparatus. Care should be taken not to trice the individual up so high that the support afforded by the heels is lost, as, in my opinion, without this precaution the spinal column is too much straightened by the weight of the lower extremities, and the natural curvature thereby lessened.

This latter bandage secures the tin braces firmly in position, and retains them there without further support. A second or outer bodice, made exactly like the first, is now framed and applied, using the solution of silicate of soda freely, in order to secure its uniform adhesion to all the inequalities which the surface of the jacket now presents. This completes the process for the present, and the patient, being lowered, is laid upon a firm bed (care being taken in the transit to disturb the set of the jacket as little as possible), and allowed to remain at perfect rest for two or three hours, at the end of which time the silicated material will have become sufficiently firm to admit of further manipulation. I have observed that a temperature of about 70° F. in the room will hasten the stiffening process, and would recommend the apartment to be kept in that condition.

The jacket is removed from the body by making an incision along the centre, in front, and carefully slipping it off. Before cutting, however, it should be carefully marked and trimmed—where trimming is necessary—under the arms and bottom. It may be cut off at top, both back and front, as low as the patient may desire, provided, always, that it is not so low as in the

judgment of the physician will interfere with the proper support of the affected structures.

At bottom, it should be made to extend several inches below the crest of the ilium, and cut off in the direction of the symphysis pubis, so that the lower part of the jacket, when the patient is seated, will not rest heavily upon the thighs, thus pushing it up and out of place, rendering the patient uncomfortable, and defeating the object intended, a perfect support. If, after cutting the jacket prior to its removal, the edges should lap when brought together, showing too much material, they should be trimmed off so as not to meet by about one inch. In trimming off the front edges, care should be taken to divide the space equally between the two sides, where the centre of the jacket is the part manipulated, otherwise it will give the apparatus a one-sided appearance.

For convenience in the further mechanical construction, I remove the jacket to my office. It is yet in a semi-plastic state, the heat of the body not being sufficient to render it as hard as it must be to answer the purpose for which it is intended.

I place it upon a table and smooth out all the folds and wrinkles on the inner surface, taking great care not to destroy the shape.

This done, it is removed and placed upon a clothier wire frame, and dried carefully at a stove. When the material is sufficiently hardened, place it over a rounding block, and with a round faced hammer pound down all the roughness and projections left upon the inner surface. I sometimes line the inside with pieces of muslin, using as an adherent the silicated solution, and bind the arm spaces, and all other trimmed edges with pieces of muslin cut bias, not sewed on, but attached by the use of the soda. This is done to prevent the separation of the different cut edges, and render the jacket more durable. The front edges are now eyeletted or supplied with eyeletted cloth riveted on; several rows of holes about the size of a No. 16 catheter should be made in several places with a steel punch over a hard block of wood. This will allow the escape of the natural exudations of the body, and will afford all necessary ventilation. All openings should be made from the inner surface outward, in order to prevent the formation of prominences on the inside of the jacket. The instrument is now ready to be placed upon the patient.

In order to ascertain whether the curves in the jacket, particularly that of the region commonly termed "the hollow of the back," correspond with those of the body of the patient, careful measurements of the patient should be taken and compared with those of the jacket. This is most conveniently done with a common yardstick, by placing one end upon the bony prominence of the scapular region, and the other upon the nates, and measuring the arc described between the straight edge and the body with a common foot rule. The anterior curve, or that of the region commonly denominated "the hollow of the back," is ordinarily from an inch and a quarter to an inch and one half in the adult, and the jacket should be made to have this curve in order to give that support to the diseased structures which is necessary to a successful treatment.

In posterior curvatures it will be impossible to adhere to the rule laid down above, yet the patient needs support as much as any other class of cases who may apply for treatment. If any alteration in the jacket is necessary to its proper conformity, it may be accomplished by slitting the jacket at that point and removing an elliptical or wedge-shaped piece. The opening thus made is drawn together by puncturing holes in either edge and drawing together by means of a lacer or linen tape. I have now carefully and minutely described the mechanical construction of my jacket, and I feel assured that if my professional brethren will follow my process strictly, success will attend their efforts, not only in the construction of the jacket, but in affording relief to those of their unfortunate patients to whose infirmities support is rest, and rest is the natural therapeutic agent for the relief of pain. When about to adjust the jacket upon the patient finally, he or she should be extended in the manner formerly described. The jacket is then put around the body and set to its place. If too hard to adjust easily it may be softened by the application of hot water. It is now ready for lacing. Begin with a long lacer about the third or fourth hole from above down, lacing until you reach the umbilical region, there drawing it through and making a loop long enough to tie on either side, proceeding to lace tightly until the lower edge is reached, where it is fastened. The object of leaving the tie loop in the umbilical region is to draw it tightly together at that point, thus making extension and counter extension at the same time. The bony structure of the scapular and iliac region

serves as a fulcrum upon which to have the weight of the space between.

Then begin with a short lacer and lace it through the four upper holes, draw it as tightly as the patient will allow and tie. The object of this short and separate lacer is, if the patient is a female, to relieve the mammæ from undue pressure. It is my custom to protect the mammæ in females from any undue pressure by artificial breast shields made for that purpose. No dinner pad is necessary with this jacket, as the patient may find relief after a hearty meal by simply loosening the tie loop in the umbilical region, the lacer at top being sufficient to hold the jacket in place. In females who suffer from uterine displacement, this jacket has so far presented no ill effects resulting from its use.

It is lighter than any similar appliance and quite inexpensive, the quantity of the solution of the silicate of soda used being from two to four pounds, one-half being wasted in the construction of the jacket, costing about thirty-five cents, and muslin at eight or ten cents a yard will not add greatly to the cost of the whole. The silicated solution does not set near so quickly as plaster of Paris, does not crack or crumble, and is more durable. The lacing admits of its removal at any time for the purpose of cleansing the body, and after the first adjustment, no extension being required, the patient takes it off and puts it on without assistance.

The length of time one can be worn I am unable to say. I have a number of patients who have worn them constantly for two, now going on three, years, and to-day they are as firm and neatly shaped as when first put on. In fact, the only case in which I have been called upon to replace them with new ones is where the patient, being a very young person, has grown out of them, the original jacket preserving its shape and texture.

The weight of this large jacket, suited to a person weighing 140 pounds, is two pounds eight ounces, and the small one, suited to a child between one and two years old, weighs $10\frac{1}{2}$ ounces. The time required to mould one upon the body is from thirty to forty minutes.

A Method of Ascertaining the Extent of Curvatures.—I have found that careful measurement from the acromion process of the scapula to the symphysis pubis anteriorly, and from the same process to a central point in the sacro-vertebral region pos-

teriorly, will give the stature of the body. If the equilibrium is at all changed, this measurement will at once show the extent, which may not be perceptible in the spinal column; if the curve be the result of spinal disease, there will be a corresponding depression of the shoulder on the opposite side of the arc. But if this curve be due to a shortened limb or a diseased hip-joint, the shoulder will not be depressed, but will remain in the natural position as in compensatory curvature of the spine. Also mensuration from the crest of the *ilii* to the sterno-clavicular articulation exhibits any departure from the horizontal position of the pelvis due to curvature in the lower portion of the spine or to mal-adaptation of the lower extremities.

I have only recently made these observations and present them for further investigation, hoping the profession will interest themselves in the idea advanced. It will greatly facilitate the diagnosis and prognosis in the examination and treatment of spinal disease. The advantages it possesses over others, in construction, adjustability, and symmetry, are worthy of repetition.

In construction it is light, perforated, strong, durable, simple, and of small cost. In adjustability, being eyeleted as a *corset*, it is removable without destruction, allows alteration for ease to deformity, yet capable of giving constant support, besides permitting the body to be cleansed and reclothed. It does not destroy symmetry, having been worn unobserved.

THE DEVELOPMENT OF THE OSSEOUS CALLUS IN FRACTURES OF THE BONES OF MAN AND ANIMALS.

By HENRY O. MARCY, M.D.,

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The results of the investigations which I have the honor to present to you, upon the repair processes in fractures of the bones of animals and man, are quite different from the teachings which I had received, or my previous accepted conclusions. My studies in this direction were prompted by my clinical observations upon the repair of fractures under various modes of treatment, and especially from my belief, that after careful adaptation and complete rest secured with plastic splints, there occurred, under favorable circumstances, a primary union in bone not unlike that taking place in the repair of superficial wounds.

In one or two monographs upon the treatment of fractures, published some years since, I inculcated this thought. I have availed myself of the great profit derived from the teachings of Comparative Pathology, and have selected the rabbit as the most convenient animal from which to make decalcified injected specimens. First of all, I would give full share of credit to my friend and co-laborer, Dr. A. F. Holt, of Cambridge, whose painstaking and carefully prepared microscopic sections will be appreciated by all engaged in this difficult field of histological research.

A most interesting chapter in the history of medicine would be furnished in giving the different views held in relation to the repair of bones, did the occasion permit. From the time of Galen, the fathers accepted his teaching that "the gelatinous moisture," as he called it, which surrounds the fractured extremities of a bone was the material that formed the new osseous growth called callus. Dupuytren, enlarging upon the doctrines

taught by Galen and Haller, asserted that "nature never accomplished the immediate union of a fracture save by the formation of two successive deposits of callus, one of which is derived from the periosteum, adjacent tissues and the medulla, while the other, formed perhaps from the broken extremities of the bone itself, is found at a later period directly interposed between their surfaces." After the publications of Ollier, in 1859 and 1860, upon the osteo-genetic property of the periosteum, surgeons and anatomists were agreed in rejecting the doctrines taught concerning the formation of the callus, and maintained that the neo-formative process was due wholly to the periosteum. These were the teachings received during my pupilage.

One of Italy's most distinguished students, Prof. G. B. Ercolani, of Bologna, published in 1866 a monograph upon the repair of fractures, and gave as his conclusion that the extremities of a fractured bone took no part in the process resulting from which the osseous callus is formed, and that the periosteum near the fracture is a less important factor than is usually believed, oftentimes undergoing even a destructive process.

In 1867 Billroth, in his important investigations upon the regeneration of bones in fractures,[1] closed with the following conclusions: "If we now view the processes as a whole, we see that the cell infiltration in the bone itself as well as in all the surrounding parts aids in the formation of callus, and that hence the periosteum plays no exclusive osteo-plastic role." This might have been concluded *a priori*, for if the periosteum alone formed the external callus, as was supposed, the portions of bone free of periosteum, as those places where tendons are attached to the bone, could form no callus, which is directly contradicted by observations. In normal growths also the periosteum does not by any means have the importance ascribed to it in the formation of bone, for we may just as correctly regard the layer of young cells lying on the surface of the bone and extending into the Haversian canals as belonging to the bone as to refer it to the periosteum. This distinguished surgeon arrived at these conclusions after much careful study upon dogs and rabbits.

From the most remote antiquity it has been known to surgeons, that all about the place where a fracture of a long bone has occurred, there is observed in a few days a material of a

[1] Surgical Pathology, American edition, p. 181.

gelatinous appearance mingled with a greater or less quantity of blood. This is elastic, becomes more firm, is smooth externally, and everywhere embraces the fragments. This is the so-called soft callus, and is destined to be changed into osseous substance. These neo-formative processes have been the subject of careful study by many investigators from Galen to our own day. Differences of opinion have been held as to the origin of the neoplasm and the elements which share most actively in the new growth. Some have believed that it is derived from the blood and its coagulated elements. Others regard it as elaborated from the medulla of the bones. More recently the periosteum alone has been held as the active factor of reproduction. Again, after Billroth, these changes have been assigned to the bone itself.

"This new material," he says, "is developed from the connective tissue of the medullary cavity of the canals of Havers, which proceeds from the surface of the fracture, meets the like tissue which comes from the other fragments, and is blended with it in the same way that the union of the soft parts is effected." This would be analogous to primary union in superficial wounds. Influenced by his own researches in Comparative Pathology, Prof. Ercolani claimed, in 1867, that the periosteum was destroyed in the place where the soft callus was formed, and as a consequent, it could take no active part in the formative processes.

This was in a measure confirmed by Billroth, and both are now agreed that it is to a new periosteum, formed upon the soft callus from a thick layer of connective tissue, to which must be ascribed a very important function.

If there was error in Ollier's theory, which made the formation of the callus depend upon that portion of the periosteum which is destroyed and absorbed, Billroth's teaching is also incomplete, when, to the new-formed periosteum, he would attribute the development of the osseous substance of the callus, since this is the result of two equally indispensable conditions, namely, periosteum or ossifying organ upon the one side, and ossiferous organic elements upon the other. Therefore, as the irritated periosteum finds in the exudation from its own vessels the ossiferous elements, so the new periosteum, which is under discussion, finds in the soft neoplasm ossiferous elements, without which the new-formed periosteum, like the old periosteum

in sound bones, though it repairs the waste of the bone, is yet inadequate to the reproduction of new osseous substance.

Ercolani says, "that comparative researches, moreover, will show, not only that the new doctrine taught by Billroth on the formative process of the callus is erroneous, but also that no single principle is sufficient to explain the formation of the callus in the different cases of fracture."

This would naturally differ, not only in the long and the flat bones, but according as fractures of the long bones are simple or compound, and also in simple fractures, whether the fragments are maintained close together or apart from each other during the period in which the callus is formed.

Before proceeding to study in detail the importance of the several elements or tissues existing at the place where a fracture may occur, it is necessary to refer briefly to the normal development of bone, for it would seem a fair deduction to suppose that the repair processes in a fracture do not very widely depart from those of formation. Examine the growing bone of a very young child. The condyles are composed of cartilage, and the periosteum is continued from the shaft of the bone over the cartilage, the outer layers of which have assumed a fibroid character. This is the way in which the periosteum is formed, and it may be considered a fibro-cartilage developed out of the temporary cartilage, from which the shaft of the bone is produced. This newly-formed fibro-cellular tissue, covering the developing bone, contains living cells of precisely the same nature as those from which the shaft is constructed, and, in this manner, the circumference of a long bone is increased, as layer upon layer of the cells ossify, arranging themselves into Haversian systems.

This vitalized matter, the germinal material of Beale, under favorable circumstances, surrounds itself with a soft hyaline substance, which, as it increases in quantity, separates the nuclei of the original cells from one another, and about the nucleus there is secreted into the hyaline material lime salts, and, so to speak, each cell becomes encased in a shell firmly fixed to its neighbor, and thus the so called osteo-blasts become bone corpuscles.

This is the end of the development series, the highest possible form of osseous growth, and the integrity of its vitalized conditions is maintained by the nutritive supply furnished through the Haversian and canalicular circulation.

A priori, it would seem, that from cells thus encased and developed to maintain the integrity of firm support required in the osseous structure, little or no part could be taken by them in the process of repair. Their germinal matter is locked up, so to speak, in an earthy encasement, and cannot subdivide for the production of new cell growth; increase of material in the circulatory system of the bone would within a certain limit only increase the development of earthy material to the expense of the cell itself or of the intervening canals, as, for example, the so-called eburnated exostosis, and exceeding this, as in other tissues, would react to the death of the cell itself, the very changes that take place in necrosis.

In the medullary canal of long bones there is found a network of cytogenic or adenoid tissue continuous with that of the endosteum, its meshes being filled with a vast number of corpuscles, which, histologically and claimed functionally, are not unlike those of the spleen. Several excellent observers maintain that this plexus of adenoid tissue is the commencement of a lymphatic system in bones. We cannot doubt that these structures play an important part in certain pathological changes of the bones, and it is a fair inference that they modify and control to a certain extent their normal nutrition, and, when called into especial activity after injuries, the process of repair.

The material forming the soft callus in the first days after a fracture is furnished from the blood of the lacerated vessels, as well as from the connective and other tissues injured, including those of the medulla and Haversian canals.

Since these elements are furnished from these various sources, and may not be unlike in character, it is impossible, in the mass, to distinguish them as to their origin, or to say what part they take in the process of restoration.

It may be assumed that the exuded blood is not a very important factor, for we learn clinically that a copious effusion of blood always delays, instead of assisting in the repair, and thus we infer that the white globules, as well as the red, undergo a process of absorption, and are not especially valuable agents of regeneration, and that even when the amount of effused blood in the callus is small, it is an entirely secondary and unimportant factor in the formative process.

It must be conceded that the part which the medulla takes in the restorative changes may be much more significant than

that of the effused blood, for it cannot be denied that the exudation from the connective tissue and its vessels assumes distinctive importance.

This is shown by ossific depositions in the medulla, after artificial irritation; also, in some instances, by extensive ossifications of the medulla in fractured bones, which for a long time impede the re-establishment of the old medullary cavity, and by the consolidations of fractured flat bones, owing to the ossification of their spongy substance.

However, observation clearly shows that, in the long bones, in some cases, the part which the medulla takes, though very considerable, is yet not indispensable for the formation of the callus, as it is found, and very solidly formed, in the bones of birds which have no medulla.

Neither has it any importance in man or animals, when the fragments of the broken bone are kept apart, since they are then reunited by means of an osseous bridge, entirely external. The surfaces of the separated fragments remain inert, and without ossification of the medulla within their medullary cavities.

Through the kindness of Professor Hyatt, of the Boston Natural History Society, I have selected two specimens of the many at my disposal, which show the formative processes of repair in birds. The first is the ulna of a swan. Held as it was, with very little displacement, resting upon a veritable water bed; the repair has gone on with singular effectiveness and symmetry, leaving so little deformity that it was by no means certain that a fracture existed until the bone was sawed open.

The other specimen—the humerus of a turkey—shows the great deformity which ensued, and the union which has taken place is by an osseous development, cementing the fragments separated a considerable distance from each other. The femur of a cat—a beautiful specimen from the Jeffries Wyman collection—exhibits great displacement of the fragments, with shortening. Not only do we fail to observe any trace of neo-formative process upon the borders of the medullary cavity of the bone, but the fragments, subjected to an actual atrophy of the osseous substance, present smooth and rounded ends, instead of sharp and cutting angles. Hence we may conclude that the part taken by the medulla in the neo-formative process of the callus in the long bones, although usually important, is by no means

necessary, and, like the white globules of the blood, occupies a place of secondary importance.

These examples of osseous callus in the human species are most frequently met with in the clavicle and femur, in which great displacement of the fragments is more common.

Prof. Putnam of the Peabody Archæological Museum of Cambridge, very kindly placed at my disposal for study the very large collection of pre-historic bones, among which are found many fractures; of these, several long bones are interesting, not only as illustrating the formation of the osseous callus in bones, the extremities of which are widely separated, but teach, so far as these specimens go, that the art of surgical appliance to fractures was not well understood by the mound builders of the West.

Since the publication of Professor Ercolani before mentioned, my attention has been called especially to fissures in bones, or so-called partial fractures, because the significance given by him to the changes which supervene was to me new and peculiar. They show that it is not possible to accept the fundamental part of the doctrine held by Billroth in regard to the formation of the callus.

In his monograph, published in 1878, Ercolani figured several old fractures of the bones of the horse, which exhibit to a remarkable degree the absorptive changes which take place in the line of the fissures, and stated that he thought the bones of the horse are much more liable to undergo these changes than are those of man. He described, however, a human skull in which these changes had occurred in a marked degree.

Believing, if processes of absorption supervene in the fractures of human bones, they must be very rare, I have taken the occasion to examine several of the largest collections in the United States, and have failed to find any marked illustrations of absorptive changes occurring upon the line of fissures in any of the long bones. I have found, however, a number of old fractures in the flat bones which exhibit very well these processes. If it be true, as Billroth taught, that the Haversian system is the important factor of repair, we ought to find the most favorable condition possible for this in partial fractures or fissures of the bone, for in these we have no displacement of fragments, and the injury to the periosteum is reduced to the

minimum. Yet it is precisely here a process of absorption frequently supervenes, and the fracture is never completely repaired.

I would express my great obligation to Dr. F. H. Whitney, Curator of the Warren Anatomical Museum of Boston, for the loan of several specimens, showing these changes, which hitherto have passed without explanation, or even special observation.

The specimen numbered 983 is catalogued simply as a fracture of the coracoid process of the scapula, contributed by Dr. J. C. Warren, 1847. A more careful examination of it shows that the edges of the fracture, which had extended into the glenoid cavity, have undergone no effort at repair, yet, upon the superior border of the neck, there is an abundant formation of new bone, filling the supra-scapular notch, and extending along a fissure running nearly the whole length of the supra-spinous fossæ. Upon the anterior side, an extensive periostitis had supervened; yet, instead of a deposit of new bone, there is a marked absorption, running the whole length of the fissure.

Number 973, presented in 1859, by Dr. R. M. Hodges, is a cranium, upon which are seen the effects of an old fracture. There is a cleft in the right parietal bone, about five and a half inches long, one inch at the widest part, irregular in shape and horizontal in its direction; anteriorly there extends from this opening to beyond the median line a fissure that has the appearance of a fracture.

The internal surface is much more irregular, and has a peculiar eroded look for some distance beyond the depression upon the external table. Posteriorly a crevice, with erosion and much roughness, extends from the opening downward into the occiput, and is more clearly defined internally than upon the outer surface. There is no deposit of new bone, the edges of the large opening have a smooth appearance, and the structure of the whole bone is quite healthy. This specimen was from a dissecting-room subject, about thirty-five years of age. There was a deep cicatrix externally, corresponding to the large opening, and anteriorly there seemed to be a smaller one. It was questioned whether this might not have been a case of burn or disease.

The specimen number 974 of the catalogue is also of great interest, as it shows an old fissure of the occiput on the median line, entering the occipital foramen, which is enlarged considerably, posteriorly. Much absorption has taken place along the line of the fissure, to which is evidently due the irregular en-

largement of the foramen. Equally important for study is a skull furnished me by the courtesy of Dr. J. C. Warren, from the private museum of his father and grandfather. It is labelled, "Soldier, Napoleon's army, wounded at the battle of Pyramids, died at Hotel des Invalides, 1832." Thus it appears the man survived his injuries, probably sabre fractures, thirty-four years. It is remarkable on account of a depressed fracture of the frontal bone, a little to the right of the median line, one and a half inches long, of U-shaped character, showing failure at union along its edges with considerable loss of substance from absorption. In the right parietal there is one old fissure, extending from the squamous suture upwards and forwards three inches, but only through the external table. In the left parietal, posteriorly, there is a fissure from near the median line through the temporal bone to the base of the skull, in part through both tables. The entire skull is very thin, the diploe being almost everywhere absent.

In the Medical and Surgical History of the Rebellion, there is given a full plate illustrative of a specimen contributed to the Army Museum at Washington, by Assistant-Surgeon S. E. Ayres, as an example of sabre fractures of the vault of the cranium. The patient stated he had been wounded several years before, by a blow from a sabre, and since his recovery, although still in service, he had been subject to occasional convulsions. In one of these he died. There are to be seen multiple united sabre fractures of the os frontis and united linear fractures of both parietals, and disjunction of the coronal suture of the right side. Most of the fractures had penetrated the lamina vitrea, which was much thickened in the vicinity of the injuries. Several detached fragments of the inner table had reunited, and exhibited an eburnated appearance. Along the sagittal and coronal sutures and in the neighborhood of the incised fractures, there were osseous deposits of long standing. Another illustration of fissuring in bone is taken from Part Second of the Medical and Surgical History of the Rebellion. It is a gunshot injury of the left ilium, extending to within an inch of the acetabulum, to which it is connected by a deep fissure, the edges of which have undergone, in a marked degree, absorption.

A periostitis had taken place all about the injury, except at its superior border, where the bone is necrosed, yet there is not the slightest evidence of repair about the fissure.

These specimens plainly teach that in the cranial vault, where fissures occur without disturbance in bone, osseous callus is not deposited, but instead there are found very evident osseous clefts. These facts lead to the conclusion that the neoplasm which originates from the contents of the canals of Havers cannot of itself alone possess a true osteo-plastic value. The causes, which would seem to have led to the absorption in a manner not unlike that seen upon the rounded ends of misplaced long bones, may be referred to the destruction of the periosteum at the place of injury, and will be discussed as we examine in detail the part which is taken by the periosteum in the process of repair.

Professor Ercolani stated in 1866 "that repeated observations had demonstrated to him, that the periosteum underlying the soft neoplasm surrounding the fractured bone was shortly attacked by a complete process of destruction."

In 1867 Billroth wrote, "that the periosteum disappears in the new tissue, and in the callus in the course of ossification." After this clear and precise statement, he asserted, "the periosteum has not a very important share in the formative process of the callus." When we remember the emphasis which he placed upon the osteo-genetic function of the irritative exudation from the Haversian system, we are led to believe he meant the periosteum in general, for he did not describe a metamorphosis of periosteum taking place in the callus, hence, we conclude that he must refer to destructive changes, when he stated that the periosteum disappears.

This is an important conclusion, and one to be carefully reviewed even when taught by so illustrious a master.

We may assume that it is an unquestioned fact, that to the integrity of the periosteum corresponds the integrity of the bone which it covers, and that to lesions of the periosteum correspond alterations in the bone; also that a moderate degree of irritation in the periosteum suffices to determine an excessive production of osseus substance, while a serious and profound lesion of the periosteum produces an opposite effect, the destruction of the substance of the bone.

Let us compare these observations so universally accepted, with the specimens before described. In these several examples, along the fissures there is found scarcely the slightest trace of neo-formation of osseus substance, yet a little way therefrom

appears a more or less abundant deposit. It would seem a fair interpretation, that in the place where the fissures of the bone occurred, the lesion of the periosteum was so serious as to produce a sudden cessation in its osteo-genetic function, while in the neighboring parts, where the irritating and inflammatory process became necessarily less severe, there the process of osseous neo-formation was active. If the injury to the periosteum in simple fractures, or even fissures, is followed by results so serious as to put an end to its osteo-genetic function, it must, in a yet larger measure, be true in the more severe injuries and in compound fractures; this is abundantly proved in the long bones, either human or animal, which have consolidated with displacement of their extremities. We have already shown that the osseous substance at the apices in displaced fractures after a time undergo a marked atrophy, and, in the series of microscopic preparations from the rabbit to be described presently, we think it is demonstrated that these changes by absorption of the old bone commence within a few days after the injury.

This is in direct evidence that the exudation from the Haversian system, as earlier remarked, has not, in these instances at least, an osteo-genetic function. From these observations, and equally important ones derived from the study of fractures in flat bones, and especially from the demonstrations in the microscopic preparations referred to, it seems a conclusion from which there is no escape, that the periosteum at the place where the fracture occurs takes no part in the neo-formative process, but is actually destroyed. One following thus far in the analysis of the different factors which enter into the regeneration of bone, and finding that each may be excluded as non-essential, will be led to inquire: what then is the physico-pathological process by means of which the callus is formed? This differs in a great measure according to the form of the bone, whether flat, spongy, or long; the kind of fracture, whether simple or compound; and the position which the fragments of the bone assume and retain during the period of repair.

The results of careful study of these processes in the long bones of the rabbit we now give as the best possible illustration of what we believe occurs in the long bones of all animals when placed under similar favorable circumstances.

The series comprise twenty animals, from the third to the twenty-fourth day inclusive, all having been submitted to the

same treatment. The animals were etherized, the leg fractured, and at once secured in a plaster splint. They were then chloroformed at the desired period, a canula was inserted through the left ventricle into the aorta, and the blue gelatine solution injected quite warm. After repeated experiments, we have determined that the best means of injection is by the continuous stream under steady, but not too great, atmospheric pressure.

Third Day.[1]

The preparations of the third day after the injury, the apposition having been nearly perfect, show very few marked changes. The edges of the fractured bone, which upon one border were considerably splintered, have scarcely altered, the neighboring vessels are not enlarged and only a few red and white blood-cells are to be seen. There is a small quantity of plasmatic fluid about the fractured ends which, magnified five to six hundred diameters, is shown to be composed of fine granules. The Haversian system appears unaltered and the periosteum is infiltrated with red corpuscles.

Sixth Day.

The changes from the third to the sixth day are instructive. There are seen a few bloodvessels already formed in the new callus, which is distinct, and the exudate between the fragments is blended with the old bone. A nearly amorphous or finely granular material fills the interspace. This is under the most favorable conditions, as the fracture was not complete.

Ninth Day.

The changes which have taken place in the specimen of the ninth day are of much greater importance. The blood effused into the medullary canal has been largely absorbed, and we see in the finely granular matrix loops of new vessels rapidly forming. Many of them are ectasic in character and inosculate with the medullary vessels. The borders of the fractured bone

[1] The microscopic preparations were exhibited by means of the oxy-hydrogen or calcium light, representing upon a screen the sections at different diameters. This article was intended to have been illustrated by photographic representations, but after several attempts by one of our best artists, they failed to be sufficiently satisfactory. We much regret it, for it is impossible to substitute a description which, at the best, is simply the observer's opinion.

are somewhat softened and cemented by the same finely granular material as seen in the specimens from the third and sixth day.

The vessels of the Haversian canals remain unchanged. The periosteum presents marked modifications at the side of the fracture, upon both borders of the bone, there is a distinctly defined disintegration of the periosteum with absorption, less extensive where the fragments are in close apposition. Extending several lines in either direction there is an abundant deposit of the formative callus, or grume of the earlier writers, which infiltrates and incorporates into itself certain fibres of torn muscular tissue. This contains a few red and white blood cells. Upon one border of one of the preparations of this date there is an extensive fissure, which shows no effort at repair, but on the contrary an active process of absorption has taken place upon the osseous borders, and the interspace is filled with amorphous material. There is considerable displacement.

Tenth Day.

The specimens of the tenth day are described because they exhibit the development of the so-called internal callus. There was no displacement of the fragments, and hence a less active periosteal development. The new material upon the medullary borders is distinctly ossific, and is carried forward in diverticuli separated from each other by loops of vessels, surrounded by a bed of germinal matter. Upon the inner border of the fractured ends, there is a very considerable layer of cartilage cells. The capillaries are chiefly prolongations of the medullary vessels, although some are traced directly into the Haversian canals, and there doubtless inosculate with each other. The injected Haversian vessels are no larger than in the bone quite remote from the fracture, and the active part taken by the Haversian system, as claimed by Billroth, is not found. The medullary vessels in the vicinity of the fracture are considerably enlarged. There is also a trace of the necrosis of the old periosteum, and the overlapping of the new periosteal growth is well shown.

Twelfth Day.

The specimens of the twelfth day show beautifully the more perfectly developed series of vessels in the formative callus, both of the periosteum and of the medullary canal, many of the loops

are ectasic, cartilage cells are abundant, and osteoblasts have formed in the new periosteum. The point of destruction of the old periosteum is replaced by layers of cartilage cells. Here is first seen in the series, the process described by Billroth, namely the absorption of the bone about the Haversian canals, and a granular amorphous deposit on the line of their vessels. These changes are confined principally to the borders of the shaft beneath the new periosteal development; the vessels in the central portion of the old bone have undergone no change.

The separated edges of the fractured bone have a granular appearance, and are cemented by a protoplasmic mass, which reveals no cellular development even when magnified to eight hundred diameters.

Fourteenth Day.

In this radius which was simply fissured, the periosteal development is reduced to the minimum, while the finely granular material, filling the fissure, the edges of which have undergone distinct absorptive changes, is more clearly nuclear and highly refractory. The Haversian canals are being rejoined through the deposited material. The injection failed to enter the finer vessels.

Sixteenth Day.

The specimen from the sixteenth day shows especially well the injection of the vessels in the developed callus, which is in a great measure ossific. The place of the old destroyed periosteum is refilled with cartilage cells.

Nineteenth Day.

The specimens of the nineteenth day show yet more interesting changes than any of the previous ones. The displacement of the fragments is very considerable, and the callus is in proportion developed. The changes in the shaft of the old bone are less marked, and are chiefly confined to its periosteal surface. The Haversian canals are very little altered, the medulla, although the bone is displaced by half its diameter, has taken, equally with the periosteum, an active share in the reparative process.

Twentieth Day.

The displacement in the specimens of the twentieth day was very slight, and the process of repair is much more advanced than in the preceding one.

Twenty-fourth Day.

The specimens of the twenty-fourth day show complete and true ossific union. The Haversian canals are re-established throughout the divided portion, and much of the redundant exudation has been absorbed.

From these microscopic studies we may make several deductions.

First. As to the existence of the exudation from the parts surrounding the fracture, which as early as the sixth or eighth day is well developed, and covered with a smooth shining surface, the *new* periosteum.

Second. The destruction of the *old* periosteum at the point of injury.

Third. It seems to me to be demonstrated, that the exuded elements have an individuality peculiar to themselves; that this protoplasmic or germinal material is placed in such relations to the new and very vascular periosteum that osteoblasts are rapidly evolved, which arrange themselves in relation to each other and the previously formed material in accord with a fixed law.

Professor Ercolani arrived at a somewhat similar deduction when he said, "that this new periosteum which is formed impresses its osteo-genetic action on the exuded cellular elements, and it is by this that they are transformed into bone."

Two conditions are indispensable for the development of the external callus and its ossific function: First, there should be an exudation of plastic or germinal material; and second, that this should be covered by or in close relation with a newly-developed periosteum, and either of these conditions failing the repair processes are not perfected.

This condition of the transformation of the soft neoplasm into osseous substance shows us, as referred to when describing fissures of bone, why the consolidation of fissures does not take place, and this in turn teaches the importance of recognizing these two fundamental factors in the formation of the callus.

I call attention to two specimens from the buffalo, as illustrating, in a marked degree, these deductions. The first is the spinous process of a vertebra showing gunshot injury. The bullet was flattened against the bone, and is retained in its position by outgrowing spicula of new bone. To the very ex-

tremity of the process, twelve inches in length, the bone is slightly roughened, showing that a periostitis supervened the injury, but accompanied by a very limited exudation of neoplastic elements.

The second is a compound comminuted gunshot fracture of the scapula near its neck from the same animal. The fragments are very firmly united by an immense osteo-plastic new growth, increasing the weight of the bone perhaps one-third. Irritated periosteum and neoplastic material were both found in ample facturage for the new development.

The consolidation of fissures does not take place, because the exudation is less, and the overlying periosteum is injured in such a way as to lose its osteo-genetic function, and when, after a time, it returns to its normal state, as shown in the examination of the various specimens referred to, either the exuded elements have disappeared, usually reabsorbed, or have become too old to feel the ossifying action of the periosteum. As stated, when discussing the development of bone, the normal function of the healthy periosteum is to supply the nutritive elements necessary to keep the bone in a sound condition, otherwise the bones could not preserve their symmetry, and their development would have no definite limits.

In fractures with overlapping or marked displacement, we have seen that the extremities take no active part in the restorative process, but are united by an ossific mass deposited between the sides facing each other, a transverse section showing a direct continuity of substance. This osteoplastic development must be assigned to the periosteum, but in a manner quite different from that formerly ascribed to it.

We have noticed already in the ossifying callus, as early as the fifteenth day in the specimens from the rabbit, that the union between the old shaft and the new bone had become intimate, and that the new osseous substance was covered by new periosteum in direct continuity with that of the shaft at a distance from the fracture. When the exudation which is given out from the superficies of the two fragments meets, it blends, and, covered with the newly-developed periosteum, places the callus in a condition for ossification, and the union by new bone firmly joined is the result.

The exudation of soft neoplasm, which is necessary for the formation of the callus, is of great importance here for deter-

mining more actively the irritation of the periosteum in the opposing sides of the fragments, otherwise there would be no reason why the external surface should preserve its normal condition, and the new osseous substance form only at the place where the fragments face each other, and between which is necessarily found the exudation in greater abundance.

In compound fractures these factors which enter into the process of repair, vary with the condition of the injury and the disposition of the fragments. In spongy bones, where the displacement is generally inconsiderable, the most important share in the restorative process is due to the elements that compose the medullary or spongy substance, and more rarely do we find an imperfectly formed callus. A beautiful specimen illustrative of this is from the Warren Museum, and exhibits both modes of union. The patient sustained a fall three years before; death due indirectly to the injury. The anterior portion of the body of the twelfth vertebra is in large measure wanting, and separated from the eleventh by an inter-osseous space, but in the posterior part the osseous substance of the vertebra is not only in contact but very firmly united by a bridge of dense bone. There is a true ossific union externally between the portions of the fractured vertebra with a subperiosteal osteo-plastic layer of new bone, and upon the right side the folding together of the external plates is distinctly marked.

The internal callus is owing entirely to a transformation of the elements composing the medulla. The study of an ununited fracture, the humerus for example, is instructive in this connection. Here, owing to motion, the medulla in the cancellated structure of the bone ossifies without union, and after a time, by the perverted action of a process intended to re-establish the continuity of a part, actually defeats it; for the bone-forming elements have gone on to a high development of ossific deposit, locking up their germinal material, and separating the cancellated extremities by a firm bony deposit. This must be surgically removed to bring the medullary elements in apposition before it can become an active factor of repair.

Summing up the various factors which we find enter so widely into the modes of repair in fractures, we conclude that the germinal material which is effused in the vicinity of a fracture must be placed under certain defined conditions to secure therefrom an ossific development.

From Ollier's many and varied experiments upon the periosteum, he found that to produce true ossification in transplanted periosteum, this must not only be revitalized by its connection of vascular character in its new relations, but must pour out or furnish an exudation of germinal matter *sui generis.* This exudation occurs only when the periosteum is irritated, not destroyed, and then there takes place a true ossific deposit, otherwise it does not produce bone.

The process of consolidation in fractured bones is not uniform, but varies according to the quality and shape of the bones and the kind of fracture, as well as to the relations which are established between the fragments.

These different elements, as we have shown, unite in many ways to produce the final result of consolidation. Although we have demonstrated that, strictly speaking, there is no primary union in bone as in other tissues, we may safely draw the conclusion from our studies which happily has been reached from the experimental standpoint of practice, that by careful and complete adaptation of the fractured parts, we place the various factors of repair in such a relation that they most readily combine to aid in the restoration of the part, and, by retaining them undisturbed for a certain period, we assist in producing a more certain and satisfactory result.

HIP-JOINT DISEASE. (ILLUSTRATED.)

DEATH FROM TUBERCULAR MENINGITIS, IN EARLY STAGE; MICROSCOPICAL APPEARANCES; ALSO SPLINT FOR HIP-DISEASE.

By De FOREST WILLARD, M.D.,
PENNSYLVANIA.

MICROSCOPICAL EXAMINATION.

By E. O. SHAKESPEARE, M.D.,
PENNSYLVANIA.

The extreme rarity of opportunities for securing specimens of morbus coxarius in its early stage, and the absolute absence of such preparations from all our museums, render every carefully examined case of interest, and as I am unable, after diligent search, to find a single example in which the aid of the microscope has been brought to bear upon the subject at so early a date, I bring this now mutilated joint, together with these representations of the minute characteristics of the tissues, before you, that the attention of this vigorous Section may be so turned in this direction, that further examinations may in the future add to our present limited knowledge of the true early changes taking place in diseased joints.

The case from which the specimen was obtained was a boy five years of age, who came to me at the Orthopædic Dispensary of the University of Pennsylvania, in 1877. His parents were poor, his hygienic surroundings bad, his condition feeble, his immediate parentage apparently healthy, but in the preceding generation phthisis had existed in two instances. There were three children, none having died. Although no known special injury had occurred, the mother had noticed lameness for a year, but at an institution for the treatment of deformities, was told that

it was "but a habit of the child." He was therefore allowed to run about; but the watchful eye of the mother noticed soon that he was worse toward night, especially after exercise, and that he *moved this limb uneasily after retiring*, as though no position was quite comfortable, a feeling of *weariness* and *discomfort* only being complained of.

Allow me to say just here that, when such a condition of affairs exists, when these simple symptoms are present for several nights in succession, especially after an injury, no surgeon is justified in waiting for the inflammation to progress to the point of pain and fixation of the joint.

Although rigidity of these muscles is an early symptom, yet it is too late then to secure an abortion of the disease, and I contend that, until we learn to stop these cases right at this initial stage of the malady, we can never hope to *prevent* hip-joint disease. I could take my private case book and read to you of instances in which I have been able, in a short space of time, absolutely to free patients from all signs of the disease, and by a watchful care, to keep them well for a period now at least of several years.

Some may claim that these cases thus aborted were not hip-disease; but let me ask, Does not every morbus coxarius patient have an early stage in which the disease was slight? Did not this case, with sinus-riddled tissues, have a period at which only the symptoms above noted were present? Was it any less hip-disease then than now? Is a little tongue of flame any less a fire than is the raging conflagration? The crumbling, falling buildings, and the destroyed acetabulum and femur are both the results of small beginnings. It is easy to check a fugitive car at the top of a decline; at ten feet it is still possible; but at fifty or at five hundred, the result must be a wreck.

So with morbus coxarius; I assert that every day that the surgeon neglects to enforce rest of this joint, after a sense of weariness and discomfort is produced by exercise, renders him culpable.

Unfortunately, we cannot often secure the patients at this stage; but we can never do so until the general practitioners have learned to recognize these symptoms, and to prevent their cases from neglecting so grave an admonition.

Pardon the digression, but the woful results which are so constantly presented before me, from a non-recognizance of

even the positive symptoms of this disease by gentlemen otherwise capable and skilled, forced me to speak.

In the patient under consideration, this stage had passed, discomfort had been followed by positive pain, lameness had greatly increased, the left nato-femoral crease was shorter than its fellow, the buttock was flattened, and faded out upon the posterior aspect of the thigh without any line of demarcation; the thigh muscles were also flabby, there was pain at the knee, the leg was abducted, elongated, and everted, the fixation of the joint by surrounding muscles was most marked, rotation, flexion, extension, abduction, and adduction of the femur all being accompanied by that *following after* of the pelvis, which is mistaken so often for anchylosis, and which produces the accommodating curvatures in the spine, best noticed when the patient is placed upon a hard surface.

This "joint sense," whereby fixation is thus produced, furnishes a most important indication in treatment.

Pressure against the inner side of the acetabulum, near the ligamentum teres, gave pain, whether knee, heel, or trochanter were pressed upon, thus indicating the seat of the disease. Externally, there were no evidences of inflammatory trouble, except a slight thickening posteriorly to the joint.

With these symptoms there could be but one diagnosis, yet strange to say, with all these present in a case, physicians can to-day be found who will rub, and paint, and blister, and wonder why the disease still progresses.

Rheumatism of this joint may occur, it is true, but it is uncommon in children; the history of the case would not be one of steady progression; the pain would be felt most at the hip, and not first at the knee; gentle exercise would give relief; pressure would not give pain; nocturnal pains would not be present, and fixation of the joint would be but slight.

Rheumatism does present several characteristics very similar to hip-disease, in the obliteration of the gluteo-femoral crease, the alteration in the length of the limb, the limping, and the eversion; but when all the *positive* signs of hip-disease before mentioned are present, a diagnosis ought to be easy.

If a sprain or torsion of the joint had occurred, there would have been stiffening and disability, but no absolute rigidity; the muscles of thigh and buttock might even have become

flabby from disuse, but there would not have been pain in the knee, and there would have been a history of injury.

I have not time here to discuss the differential points in diagnosis, from sacro-iliac disease, periostitis, psoas abscess, periarticular inflammation, congenital dislocation, caries, spinal diseases, etc. etc., but I would say that a diagnosis can always be made if thorough examination be instituted; and whenever any doubt exists, the surgeon should always give the benefit of that doubt to the more severe disease, namely, morbus coxarius, and at once put the joint at rest. If rheumatism be excluded, he cannot do wrong, in a case where the effects of an injury are more than transient, or where slowly progressive, non-traumatic symptoms are present, in at once fixing the joint; and he who does this will find, at the end of twenty-five or fifty years, that he has to record but very few cases of serious results from hip-disease.

The patient under notice was at once put to bed, extension applied by cord and weight, the windows opened and *nailed*,—(the only way to insure fresh air unless one drives his cane through several panes of glass!)—and a general tonic treatment instituted.

At once the improvement was marked, pain ceased, rigidity diminished, appetite improved, and all seemed favorable. Such I have found the almost invariable result when the supply of *fresh* air is enforced, a fact which I cannot emphasize too strongly. With toys fastened upon ropes above the bed, the confinement after the first week is not specially irksome. I now treat mild cases somewhat differently, but in the acute, painful stage of inflammation, this plan with fixation will alone give relief. Put an active lad upon crutches, and he will manage to give his hip far more blows each day than is at all desirable. Only a few weeks since, while riding in the country, I saw a boy being treated upon this "out-door" plan; he raced down an embankment as fast as any one of his companions, and it was not his fault that he was not knocked down by the horses. In a few minutes' talk with him I was not surprised to find that he averaged about a dozen falls per day, and I was forced to the conclusion that "fixation of the joint, with the benefits of exercise," would not prove a success in his case. Much as I approve of Dr. Hutchinson's plan in general, it must be practised with prudence and judgment.

Six weeks later, examining the case under consideration, all pain and discomfort had passed away; there was no induration; flexion, extension, and rotation could now be performed passively to a considerable extent without meeting resistance, and everything seemed favorable.

In two weeks headache commenced, followed by vomiting of a most persistent form; the pain soon became intense, and its exacerbations were accompanied by piercing shrieks, constipation was most obstinate, and the characteristic train of symptoms of tuberculous meningitis, stupor, slow pulse, convulsive movements, and death on the sixth day, all followed in regular order.

Recognizing the rarity of the offering opportunity, I endeavored to secure a thorough post-mortem, but after much effort was unable to examine more than the hip-joint. From this I succeeded in extracting the accompanying specimens. In order to have the work most thoroughly and carefully done, the head of the femur and acetabulum were placed in the hands of a microscopist well known for his experience and care, and the results are as below given.

The quantity of the effusion within the joint amounted only to a few drops. The structures were all intact, but congestion and softening of synovial membrane were marked, especially about the round ligament; at no point, however, had the disease advanced to ulceration.

Microscopic examination by Dr. E. O. Shakespeare.

"The acetabulum, head and neck of femur, ligamentum teres, and synovial membrane, from the above case of hip-joint disease, were placed in my hands for microscopic examination. (See Fig. 1.)

"After decalcification of the bony parts, and hardening of the soft tissues by means of picric acid, nitric acid, and alcohol, the structures of the joint were so divided that the section cut in half the acetabulum and the head of the femur, and at the same time split longitudinally the ligamentum teres.

"To the naked eye, the cut surfaces thus obtained of the cartilages and bone, presented no appearance markedly abnormal. The cartilages were entire, and the bone did not seem to contain caseous or other visible nodules. The line of ossification at the

junction of the epiphyseal cartilaginous head of the femur with the bony neck, was nearly straight and of natural width. In the central portion of the cartilaginous head a considerable area of primary ossification could be readily seen. The curved line of the spherical surface of the articular cartilage was apparently unbroken by superficial erosion. A slight mottling of

Fig. 1.

Acetabulum and head of femur, showing discolored spots upon latter.

the cartilage of the head of the femur could be made out when the articular surface was viewed in face. An inspection of the cartilage of the acetabulum gave to the naked eye no positive results. The ligamentum teres and the synovial membrane were evidently thickened and softened; no granulations were to be seen, and no visible suggestion of the presence of miliary or confluent tubercles could be recognized therein.

"A careful study of thin sections of the various tissues entering into the diseased joint afforded the following results:—

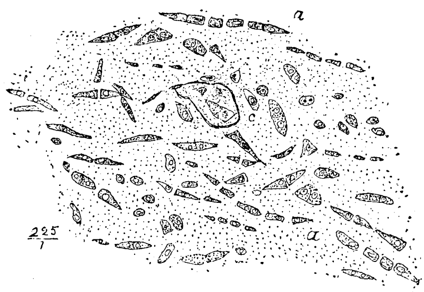
"A.—Line of ossification at the junction of the head of the femur with its neck. Nothing abnormal was noticed beyond a small amount of hyperæmia of the medullary tissue.

"B.—Below this line of ossification the cancellated structure of the osseous tissue presented no decided pathological appearance. The medullary tissue was but slightly hyperæmic. Indeed, a certain number of fat vesicles were still to be seen here and there scattered through it. There was nothing which could be diagnosed as a miliary tubercle or caseous focus. Neither were the spicules of bone or of the primary cartilage, covered by an osseous coating, in a state of carious alteration; in fine, their bone cor-

puscles were not in a state of fatty degeneration. The only change here visible was extremely slight, and could readily have been attributed to a physiological rarefaction of the primary bone—spicules, or trabeculæ.

"C.—Above this line of ossification, the cartilage between the latter and the before-mentioned area of primary ossification in the epiphyseal head of the femur, presented in various circumscribed localities a marked fibrillation (which in some places nearly approached segmentation) of the matrix or ground substance—a fibrillation usually following a general direction vertical to the surface of the articular cartilage. Moreover, the cartilage capsules in the vicinity of these areas of fibrillation frequently showed distinct signs of irritation and increased activity. They were often enlarged, the primary capsules sometimes containing a number of secondary capsules inclosing cells with a cloudy and scant protoplasm, and large nuclei and nucleoli. Some of the primary capsules were filled with a number of cells devoid of an individual capsular envelopment. In this vicinity it was not uncommon to see a mucoid softening affecting some of the elements inclosed within a capsular space, but the same species of softening also sometimes effected the enlargement of the original space, and finally channelled out minute spaces in the surrounding matrix. (See *c*, Fig. 2.)

Fig. 2.



Cartilage of head of femur, near point of primary ossification, showing minute points of mucoid softening (*c*), and linear arrangement of segmented cartilage cells (*a*). x 225.

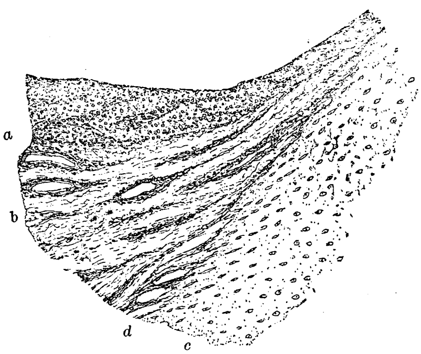
"D.—Area of primary ossification in the chondral head of the femur. Nothing abnormal met the eye, either in the bony trabeculæ or in the marrow filling more or less completely the irregular cancellæ.

"E.—The cartilage between the latter area of ossification and the articular surface, in circumscribed spots, showed a hyperactivity of the cartilage capsules, accompanied by some very slight softening and fibrillation of the inter-cellular matrix, similar to that previously mentioned, although much less frequent.

"F.—Cartilage of acetabulum. The general acetabular cartilage was nearly if not indeed quite normal. In the Y-shaped cartilaginous septum, which separates the acetabulum into three unequal sectors, and to which the ligamentum teres was attached, the prevalent direction of the rows of cartilage cells was vertical to the articular surface, except just at and a little below the line of attachment, where their direction changed to that of parallelism with the course of the ligamentous bundles.

"G.—Attachment of ligamentum teres to the femoral cartilage. (See Fig. 3, low power.) The superficial and deep layers

Fig. 3.



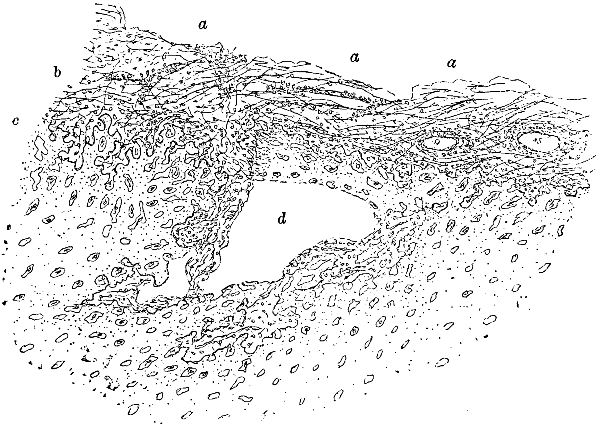
Attachment of lig. teres to head of femur. *a*. Synovial surface of ligament. *b*. White fibrous tissue of ligament. *c*. Cartilage of head of femur. *d*. Line of attachment. x. 59.

of cartilage at this location showed some increased activity. The fibrous tissue of this end of the ligament was over-vascular, and the vessel walls were surrounded by and infiltrated with embryonal cells. Aside from these characteristics, the tendinous tissue throughout its depth showed only a slight hyperplasia. The surface of the tendon, however, was covered with a loose connective tissue in an active state of inflammation.

"H.—Attachment of the ligamentum teres to the acetabulum. (See Fig. 4.) At the point of attachment, the cartilage was much softened. Along the line of attachment (*b*) the tendon

was the seat of a considerable accumulation of embryonal cells. The border of the cartilage was eaten into by this embryonal tissue in such a manner as to present, in a very marked way, the irregular and the jagged outline of a surface channelled by Howship's lacunæ (*c*). Everywhere in the vicinity of the line of attachment, the cavities which contained the cartilage cells were

Fig. 4.



Attachment of lig. teres to acetabulum. *c*. Softening cartilage. *d*. Anfractuous space. *v*. Bloodvessels in ligament at line of attachment. x 80.

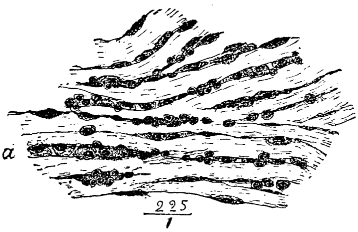
enlarged. They sometimes contained a mucous tissue, sometimes a number of embryonal cells, instead of the typical cartilage cell. Frequently two or more of these cavities united to form a larger anfractuous space, which might originally have been filled with an analogous tissue. Occasionally large areas of the cartilage were thus softened and replaced by a tissue very similar to the red medulla of bone. In the figure, such a large anfractuous space (*d*) is represented as partly filled by the medullary tissue and partly empty. In making the section, this tissue was partly loosened and displaced before mounting.

"Near the line of attachment the fibrous tissue of the tendon was permeated by numerous dilated bloodvessels, whose walls, in very many instances, were embryonal. The fibrous tissue itself was in much the same condition as that of the femoral end of the ligament—probably a little more irritated.

"I.—Ligamentum teres. (See Fig. 5, high power.) The layer of loose cellular tissue which covered the ligament was highly inflamed and greatly infiltrated with numbers of young cell-

elements. The fibrous bundles of the tendon, near the acetabular attachment and along their course towards the femoral end, were in a state of marked inflammatory infiltration.

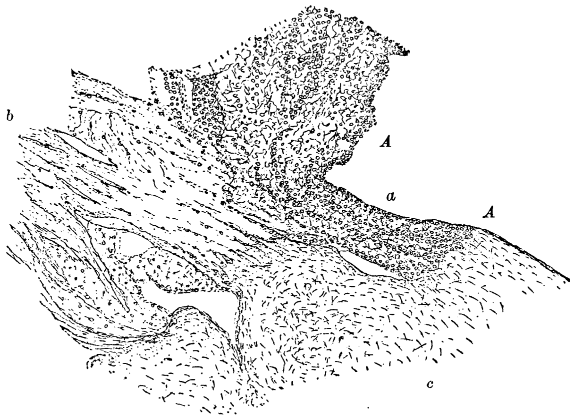
Fig. 5.



Lig. teres, deep portion near acetabulum, showing proliferation of endothelia of fibrous tissue and multiplication of leucocytes. x 225.

"K.—Synovial attachment at the periphery of the articular cartilages. (See Fig. 6, representing appearance under low power.)

Fig. 6.



Attachment of the synovial membrane to the periphery of the articular cartilage of head of femur. *a*. Synovial membrane. *b*. White fibrous tissue. *c*. Cartilage. x 30.

"The loose cellular tissue of the synovial membrane (*a*) was everywhere very thickly infiltrated with young cells—the vessels were abundant, and showed a marked cell-infiltration of their walls. The cells upon the surface of the membrane (*A*) were several layers deep. Some of them were fatty degenerated, others were in a state of multiplication. Numbers of embryonal cells were interspersed among them. At the point of junction of this inflamed loose cellular tissue with the cartilage of the

articulation was a very abundant accumulation of cells of an embryonal character, so closely heaped together that the cellular mass presented the appearance of granulation tissue or the young medulla tissue of bone. Adjoining this granulation tissue, and extending a considerable distance inward, the cartilage showed very much the same appearance as that around the small points of softening in the femoral cartilage, already described. The white fibrous tissue (*b*) upon which the synovial membrane at this location rested, was in much the same condition as that of the fibrous bundles of the ligamentum teres at its femoral attachment. Where it joined the deep layers of cartilage, however, this tissue showed signs of irritation and softening.

" *Conclusions.*—1. It is apparent that the intensity of the morbid process in this case of hip-joint disease affected mainly the synovial membrane and the ligamentum teres and its covering.

"2. While there was a slight fatty degeneration of the cartilage cells at the surface of the cartilage, there was no such decided alteration of this kind, as some authors (Cornil and Ranvier among others) believe to be the initial and essential lesion in so-called scrofulous hip-joint disease.

"3. While the femoral cartilage was the more diseased of the two cartilages entering into the formation of this joint, yet the condition of the cartilage was not sufficiently abnormal to support an assumption that the morbid process began in them.

"4. The bony structure of the neck of the femur, although hyperæmic, was but slightly altered, and was not tuberculous, and there was no tubercular formation in any other part of the joint.

"5. From the clinical history of this case and the microscopic examination, the lesions found in the joint may be regarded as those constituting the *first* or *initial stage* of at least one form of hip-joint disease.

"6. The history of this case, both clinical and pathological, would seem to support the views of those who defend the doctrine that in a certain depraved animal organism, inflammatory products tend to caseous degenerations which may ultimately cause a local or a general infection of the various tissues of the animal and a limited or an extensive irruption of tubercles.

"7. The scrofulous or degenerative inflammation of a hip-joint need not be more certainly or more quickly followed by tuber-

culosis, either local or general, than a scrofulous lymph gland is followed by the same disorder."

Remarks by DE F. W.—Reviewing with all candor the results of these examinations, we find that systemic infection sufficient to produce death from tuberculous meningitis had already occurred although the stage of ulceration or of fatty degeneration had been scarcely reached. I do not contend that the initial inflammation was tuberculous in its character, for it does not differ as far as could be discovered from simple inflammation ; but all pathologists conversant with present received views, know full well that tuberculosis is the result of even a simple inflammation ; the steps of caseous degeneration, glandular involvement, and then introduction into the system followed by an irruption of tubercles in the brain, lungs, mesentery, etc., being often easily traced. That this may occur in a perfectly healthy child, at least so rapidly, is possible, but not at all probable. In the bad hygienic surroundings of this case, even though not coupled with parental vice, we can discover the cause of development of this disease. What I believe is that a child with vitiated system, be the cause constitutional or acquired, is far more subject to degenerative inflammatory results than is the one not thus tainted. I care not what the taint be called—I believe that scrofulosis is simply a condition of system rendering its possessor subject to inflammations upon trivial causes; that such inflammations are always "languid" in their character; that they tend not to organization but always to retrograde results, whether situated in a gland, a joint, or a bone. Such is to me the only practical way of looking at this condition: a robust, truly healthy lad would recover from a blow upon a joint with but a transient inflammation: the boy in whom lurked this tendency, though outwardly as well as his companion, yet upon receipt of a similar injury would get well only at the end of five years, and then with the loss of the head of a femur or of a knee.

This child showed no evidences, either to the eye or by the microscope, that the hip was otherwise than simply inflamed; yet the sewerage from this inflamed region passing into neighboring lymphatic glands was soon carried past them, and the result was as shown—the boy became tuberculous because he possessed retrograde tendencies—his ancestry were at fault in

the first place, and his unsanitary surroundings contributed to the result.

The microscopical appearances in any single case are no more conclusive than are clinical symptoms taken from one individual; but all testimony is valuable, and by accumulation of evidence we may at last reach correct decisions.

Allow me, before concluding, to call your attention to a *splint* which I have found useful in a certain number of cases of hip-disease, *i. e.* those in which the symptoms are not active. Believing most implicitly that *absolute* rest is the chief hope in the treatment of this disease, it has always been my habit to approach as nearly as possible to this desideratum, yet realizing that with all our efforts we can only approximately reach this end. The closest approach which I can conceive is to mould over the inflamed part an accurately fitting encasement of plaster of Paris, silicate of soda, starch, felt, or other material, from the knee to the eighth rib, so as to gain a fixed point of support above. I have for years been in the habit of thus dressing fractures about the hip and thigh, especially in children, and for the past two years have been employing it for hip-disease. Should the inflammation be acute and painful, I still feel that no plan of treatment so effectually removes all the serious symptoms as to place the patient in bed and apply cord and weight extension, together with fixation by the covering alluded to. After a few weeks or months, however, when all acute symptoms have passed away, the child may be allowed to move about with crutches and with a high shoe upon the sound side—the same encasement still remaining *in situ.*

Although the surrounding muscles are capable of producing to a certain degree the fixation of joint required, yet I cannot see the wisdom in compelling them to do this work, when it can be done so much more efficiently by external supports, and without that crowding of the inflamed femoral head against the sensitive acetabulum, which must occur at each spasmodic action of the muscles, or at each undue effort when danger threatens. I can imagine nothing more certain as an arrester of motion than such a covering, and with the crutches and elevation of the sound foot I believe that we shall obtain as much elongation as by any extension apparatus, which only in theory separates the inflamed surfaces. Nearly all forms of dressing do good, inasmuch as they act as a hindrance to the activity of the pa-

tient, and all produce more or less fixation of the joint. Upon the degree of the latter depends their power for benefiting the sufferer. The difficulty, however, with this form of splint is this, that it is only comfortable in the recumbent or erect posture; sitting is next to impossible, and the splint must yield, or the patient sit in an awkward reclining position. It was to obviate just this difficulty that caused me to divide this splint and connect its abdominal and femoral portions by a hinge-joint, and, as the materials above mentioned are not sufficiently strong, I have resorted to the tough hard leather prepared by Mr. Gemrig, of Philadelphia, for the purpose of making jackets.

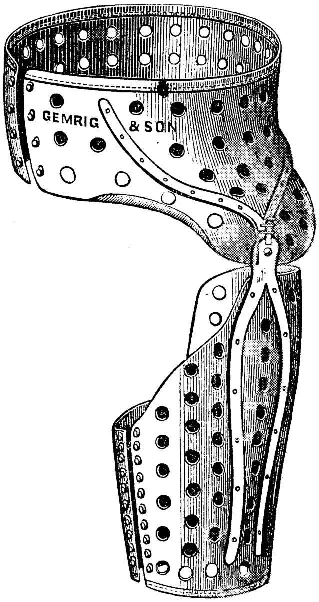
To construct this apparatus properly a mould of the body is taken by plaster bandages as high as the ensiform cartilage in front and the seventh dorsal vertebra behind, in order to secure the necessary thoracic support; thence downward, covering in the pelvic region as low behind as the point of the internatal crease, and in front to the top of the pubis; thence over hip, buttock, and thigh, to a point about three inches above the knee. If taken over a pair of thin bathing or merino drawers, it can be easily slit up when hard, and from it a cast made which will be an exact counterpart of this portion of the body. Over this the wetted leather is thoroughly rubbed and worked until, as it dries, an accurate fit is obtained. The thigh portion being then separated from the abdominal or pelvic portion, they are reconnected by a steel joint made by riveting together two Y-shaped pieces, one inverted, the other upright. The arms should encircle the body and thigh respectively for about two-thirds of their circumference, and should be firmly riveted to the leather. The thigh pieces might advantageously, in some cases, be united and continued down to the shoe, but the encircling leather thigh portion I consider very essential. (See Fig. 7.)

As this joint is only for use during sitting, it must be fixed; a simple lock I here show you. It is merely a bolt, with a broad button head, working through two eyelets in the upper portion, and driving down into a mortise or slot in the lower section. The advantage is obvious: during walking we have a joint perfectly fixed, but just at the instant of sitting, the bolt is raised, it being operated with ease through either a lady's or gentleman's clothing. A small spring prevents it from again locking until it is voluntarily pushed into place. If the joint is made strong, the action is so simple that it can scarcely get

out of order. The total weight for a man of 200 pounds is less than 2 pounds. Eyelets, or, better, shoe hooks placed on either side of the opening in front of abdomen and thigh, allow lacing either tightly or loosely.

The advantages over a perfectly rigid hip-dressing have only to be noticed to be appreciated. It allows a person to go about his ordinary avocations on crutches with great comfort, since he can sit at his desk or work, and still have support for the hip at the same time; yet at all times, except when sitting, his joint

Fig. 7.



is absolutely fixed. I do not think that the amount of motion obtained while in this position would retard a cure, as it must be remembered that this splint is only intended for cases in which the symptoms are not acute. In the third stage of the disease it will be found of the greatest comfort.

It must be remembered that this steel joint is but a hinge, so that rotation, abduction, and adduction are impossible, and thus the round ligament has an opportunity for the needed repair.

Portions of the leather can be cut away if they hurt the patient, and the edges can be padded with curled hair. Like all other apparatuses its time of wear for the first day should be strictly limited to an hour; each day increasing an additional hour.

By this rule many a so-called "worthless thing that cannot be borne" may be gradually made comfortable to the wearer.

When firmly laced it is surprising how the weight of the body is transferred from the pelvic to the thigh portion by means of the leather and steel, and the relief to the articulating surfaces is as great as is obtained by any extension apparatus. No dressing yet invented, however, is adequate to the task of permitting the patient to bear his weight upon the diseased limb.

Other methods of locking this joint easily suggest themselves, but the simplest and cheapest is the best. Other uses for this apparatus will also readily appear to the thinking surgeon, among which may be mentioned particularly the torsions and lacerations of the hip ligaments, intra-capsular fractures, and congenital dislocations. In the two latter cases it offers especially a most hopeful means of steadying the pelvis upon the thighs, although I have not as yet had the opportunity of giving it a practical test. This I shall do, however, at the first offering opportunity.

REPORT OF DELEGATES

TO

FOREIGN SOCIETIES.

REPORT OF ONE OF THE DELEGATES OF THE AMERICAN MEDICAL ASSOCIATION TO THE FOREIGN MEDICAL ORGANIZATIONS (1879-80).

HISTORIC.—May 8, 1878, at Atlanta, Ga., the American Medical Association, after hearing the Metric Note No. 6, voted unanimously the following *resolutions:*—

"1. That the American Medical Association adopts the International Metric System, and will use it in its Transactions.

"2. Requests that those who present papers at its future meetings employ this system in their communications, or reprints thereof.

"3. Requests the medical boards of the hospitals and dispensaries to adopt the Metric System in prescribing and recording cases; and that the Faculties of the medical and pharmaceutic schools adopt it in their didactic, clinical, or dispensing departments.

"4. Requests the physicians familiar with the Metric System to help their *confrères* and the druggists in its application; and the delegates present at this session to work up the acceptance of the Metric System by their respective County and State Societies.

"5. Requests our President to name a Metric Executive Committee, of which he shall be the ex-officio Chairman, and whose task will be to give unity and rapidity to this metric movement."

The committee was composed of President Theophilus Parvin, ex-officio Chairman; Edouard Seguin, of New York; E. Wigglesworth, of Massachusetts; F. R. Weist, of Indiana.

The American Medical Association appointed, also, as delegates to foreign medical organizations, Drs. J. M. Da Costa, of Pennsylvania; E. Seguin, of New York; L. P. Yandell, of Kentucky; Moses Gunn, of Illinois; J. T. Hodgen, of Missouri; Edward Warren, of France; Laurence Turnbull, of Pennsylvania; Lewis A. Sayre, of New York.

August 8th. As a member of both representations, Dr. E. Seguin presented to the British Medical Association, at Cork, the Metric Note No. 7, endorsed by Dr. Lewis A. Sayre, President-elect of the A. M. A. After which, on the proposition of Dr. Ernest Hart, Secretary of the Council, the British Medical Association appointed a committee "to report on the means of introducing the Metric System in Medicine in Great Britain." Were appointed: Dr. Clifford Allbutt, of Leeds; Dr. Lauder Brunton, F.R.S., Dr. Sieveking, Professor Frazer, Q.U., Edinburgh; Professor Harvey, University of Aberdeen; Dr. Quain, F.R.S., Chairman of the Pharmacopœia Committee of the General Medical Council, and Mr. Ernest Hart, Chairman of Council.

August 28th. At Montpellier, the Section of Medicine and Surgery of the *Société Française pour l'Avancement des Sciences*, presided by Dr. Potain, after hearing the Metric Note No. 8, gave a unanimous adhesion to the proposition of supporting the plan of medical and pharmaceutic uniformity before the next International Medical Congress of Amsterdam.

September 13th. This plan, whose base is the metric system, was presented at Amsterdam by the committee named *ad hoc*, at Geneva, and its conclusions adopted were as follows:—

A.—In regard to pharmacy. 1. It is opportune to make an International Pharmacopœia for the common use of the nations willing to accept it, as has been done in regard to agreements—postal, monetary, and others.

2. The organizers of the Congress may invite a government so disposed, to name delegates who shall act in concert with the Geneva Commission.

3. Said Committee to use the project already accepted by the previous Pharmaceutic Congresses.

4. The questions upon which they will be unable to agree will be reserved for future study.

5. By acting promptly, these International Commissaries will be able to present every two years their report of progress to the *Congrès Médical*, and to their governments.

6. The Pharmaceutic Society of Paris is invited to communicate its project of International Pharmacopœia, in order to have it printed among the documents of the Congress, unless said Society prints it promptly.

These conclusions were unanimously adopted, as well as those of the Reporter on International Uniformity in Physic, which read as follows:—

B.—1. The Metric System must be the base of medical uniformity.

2. The scales of all the instruments shall be all metric and uniform.

3. The records of observation in private practice, as well as in hospitals, must be, like the statistic tables, prepared upon a uniform plan, in order to give uniform results.

4. The members of the Congress will be invited to record their cases, as much as possible, by the graphic and numeric methods; to propagate the use of these means of positive observation among their *confrères;* to communicate to the members of this Committee the critics and improvements experience may suggest, and whose mention will find place in their next report.

5. The Section of Medicine accepts all the conclusions presented by the reporter of the Section of Pharmacy.

6. And demands that the conclusions of both sections be accepted together, as the legacy of the Congress of Geneva to the Congress of Amsterdam.

7. Invite the latter to render to this Committee, by strong and eminent choices, the vitality of which it has been deprived by the abstention of several of its members, by the death of Dr. Wilkinson, Ex-president of the British Medical Association, and by the irreparable loss of Professor Gubler, who was more than a colleague in the Committee, its strength and its head.

To satisfy this just demand, the Congress, in general assembly, reorganized the commission charged to present a report at the next session, as follows: MM. Lewis A. Sayre, of New York; Dechambre, of Paris; Ernest Hart, of London; Warlomont, of Brussels; Guye, of Amsterdam; Palasciano, of Naples; E. Seguin, of New York; Gille, of Brussels; and Mehu, of Paris.

It would considerably shorten our task to consider it ended by your acceptance of the metric system. But, speaking to one of the most enlightened bodies of physicians, certainly to the most independent, we want to owe your concourse, not to imitation of what is done abroad, but to your own full comprehension of the objective.

This objective has so much enlarged since our meeting of Atlanta that, not only the anametric physicians, but those who

have long applied the metric measures in medicine and pharmacy, like the French and Italians, are most equally in arrear before its future magnitude. I do not mean to say that the idea which calls for an extension of the use of the metric system in medicine is born since our last meeting, but that its "writing on the wall" has become so much more distinctly legible that one might almost say: Woe to him who cannot read it.

In its development, before it became an idea, it was an aspiration whose foreshadowing can be found as truth is represented, coming out of a well—disengaging itself slowly from the depths of conjectural diagnosis and therapeutics. Almost every reformer of physic had promised to render our art more certain, our science more matter-of-fact; and it is through what can be rarely called false promises, oftener through inadequate means of execution of their ideal, that school after school left so much of dross and so little of gold, not unlike the alchemists from which they had largely borrowed. But though the precious metal of truth had accumulated very slowly, physicians began to see that its accretion was the produce, not of imagination, but of observation. Naturalists, Lamarck at their head, had discovered it; that was the *Fiat Lux.*

Fifty years ago our masters had come to the conclusion that conjecture was to be done away, and that calculus applied to the well-described morbid phenomena could alone give results as positive in physic as those it gives in the other physical sciences. In their mind there was no doubt that to take positive records of cases required only the skill of ordinary statisticians; and as for the infallibility in diagnostic, who would question the ability of the founders of "the Societies of Medical Observation," and of their associates, Louis, Andral, Cruveilhier, Bowditch, Abercrombie, Richard Bright, Addison, Stokes, Skoda, Oppolzer? . . . .

That this new method was criticized and its promoters assailed, is useless to say; but I mistake, it is useless to tell how. The attacks came from several quarters; many which were personal are now levelled to the silent sod, where lie their utterers; whilst others had more of temporary weight, coming from clear but short-sighted critics, whose power of accommodation to see an idea did not extend beyond the present. Gifted with such unfortunate aptitude, it was easy for them to demonstrate that the "*méthode numérique*" of Louis was not a method, but a

simple and strong determination to better observe than others, and that their pretension to the creation of a system of reliable or undoubted observation could succeed no farther than the field of their own practice. This was true for the present, but:

The modern methodists gained by these discussions an increase of personal fame, the spread of their aspiration, and a numerous retinue of disciples, who thenceforward applied all their energies to the realization of their masters' ideas: a numerical method of observation. The giants were defeated by the pigmies, but the throne of authoritative medicine was shaken, and the rule of law in physic, as in natural history, began.

This may be a trite remark, but one which is in order here, that when a science or an industry is notoriously in arrears of its time, one or several of its co-laterals take it—figuratively speaking, by the neck—and make it advance. (It is so that we have seen architecture—mortally de-idealized for more than a century—receive a new sense of force and grandeur from the recent progress of metallurgy, and from the new dynamics which ensued.) Likewise, and at the same time, experimental physiology, and almost all the physical and mathematical sciences were preparing the instruments and the methods which it became easy to apply to the renovation of medicine in the sense indicated by the Societies of Positive Observation.

The Instruments.—(*a*) *The senses*, these, nature's exquisite instruments, have always been the gift of a few, sooner than the instruments of the capabilities of all, and were never accorded as much culture as the mind itself. However, at the time here referred to, the education, or sooner the training, of the senses in general, and of the medical senses in particular, was not only unknown, but without a name. It is then that the education of the medical senses began to be made indirectly and empirically in the first "*écoles pratiques et laboratoires*," nominally open to all, and adequate only to the wants of a few students. But it remains to this day as true as ever that the senses do not receive in the primary departments of instruction that training which would prepare them for the handling and using of the instruments of positive diagnosis and of analysis in our profession (not to mention the others); and, that consequently to this neglect, the medical senses remained comparatively paralyzed and anæsthetized, instead of being the leaders,

able to direct the operations of the mathematical instruments and methods, as the brain itself directs the mental operations.

(*b*) As for the *instruments*, properly speaking, they were all surgical, except the watch or chronomètre; for the stethoscope and the plessimètre were hardly invented, the specula, rare and awkward, with but one use, and the thermometer and scales of Sanctorius had been practically forgotten. So that one can say that all was to be created in the order of the means of observing mathematically, and all began.

I do not need to recall the labors of Kölliker, Becquerel, Vierordt, Helmholtz, Donders, Duchenne, Remak, Marey, Malassez, and all who successively invented our instruments of precision, or opened the endless series of chemical, mathematical, and autographic observations: this creative period lasted forty years, after which it remained only, some said, to rely upon the data furnished by these wonderful instruments. But no, those fine means of analysis were not connected by a common philosophy; as demonstrated by the conclusions of the specialists, great in their small sphere, more microscopists, thermometricians, electricians, etc., than physicians in the synthetic sense of the appellation; so that during the brilliant period whence we are coming out it was not genius which was wanted, it was a method.

This METHOD will result from the co-ordination of positive observations, under the bound of mathematical uniformity, which will permit to treat all the norms of health, and all the anomalies of disease, as quantities interconvertible and intermeasurable in all proportions. This method, which "the Societies of Medical Observation" had called in all their calls, and tried to produce by all their labors, was "*the Medical Mathematism.*" We have seen that the first cause of their failure was the want of mathematical instruments of observation; but there were two more:—

(*a*) The law of correlation, interchange, or sooner identity of the natural forces could not have been applied to medicine and physiology before it had been demonstrated in physics.

(*b*) The MEDICAL MATHEMATISM could not be created before mathematical uniformity itself had been determined and applied by a common consent to all physiological quantities.

Though Rumford had proclaimed the essential unity of the imponderables at the end of the eighteenth century, it was only

in 1824 that Sadi Carnot had formulated the theory of the correlation of the forces; and in 1842, that Mayer, of Heilbron, had demonstrated that the light of the sun, the disengagement of heat, the mechanical movement, the electrical affinities, etc. are various interchangeable modifications of a unique force; in other words, there is but one force which eternally passes under the appearances of living or dead nature, *calor* latent or active. Joule put this truth above controversy in physics, and Traube in pathological physiology.

(*a*) Since it has become comparatively easy, with our new instruments of precision, to verify this law on man in his physiological and pathological states, it is a truism that to a normal calorification corresponds the regularity of the other functions; and that when the equilibrium is overbalanced, the increase of the products of a function corresponds to the diminution of the products of one or of several others. That the excess of disengagement of *calor* corresponds to an increase of urea, to a diminution of weight, to an arrest of growth, etc.; that the augment of a secretion, excretion, or exhalation foretells a diminution in others, etc.

These things had been told and suspected before, but could not be mathematically demonstrated; therefore, they were neither taught nor remedied with anything like positivism. For science may be incited here and there by a belief, but progresses only when supported by the authenticity of proofs. It is so that the interdependence of the functions in health and in disease, being out of doubt only since the law of the interconvertibility of the forces has passed from physics to physiology and pathology, can now be applied with unerring continuity.

(*b*) The same advance has taken place in therapeutics, where the new instruments of observation have given the means of measuring in figures the action of a certain number of medicaments. But why not of all? Partly because this work of positive mensuration of the action of remedies is hardly begun, and besides, because where the mathematism methodically applied will, after due experiments, fail to demonstrate a therapeutic action, the failure will not be imputable to the method. But this important question is secondary here, where we have to consider only the method itself.

We have seen that the mathematical instruments of observation necessary to work this method are in working order, and

the very principle of this method, "the correlation of the forces in physiology as well as in physics," is now above discussion. It remained only to find the connective link which could unite the operations of these instruments among themselves, and with the principle; this link would give the method, and it was found in the mathematical unity, and in the universal adaptability of the metric system.

Though this system had been formulated at the end of the eighteenth century, three times recommended to the American Congress by Washington, then by Jefferson before its official promulgation in France; and though it had been employed by Humboldt in his treatise *De l'irritation des fibres musculaires et nerveuses*, before 1800, it was only about 1840 that its usage became general in medicine; and in 1880 there are yet some colleges of medicine, but not of pharmacy, which refuse to teach physic in this universal quantitative language.

If this simple enunciation of a fact looks like criticism, it is not my fault. I take the materials of my theme where I find them; and if it were rendered necessary, I would find others more unpleasant. But let us, on the contrary, refer to the idea of John Quincy Adams, an idea more American than French, which he expressed in 1817 as Secretary of State. "The metric system approaches the ideal perfection of uniformity applicable to measures and weights. It adapts itself to the greatest efforts of science; it will conquer the world, and the same metric language will be spoken from the equator to the poles," etc. What a pity to be obliged to mutilate this fine piece of common sense and prophecy; but I can use of it only one sentence, "*The metric system is adapted to the greatest efforts of science.*" Let us see how it is adapted to the progress of our profession.

It came up at the time the instruments of physical and positive diagnosis were invented, and the principle of the interconvertibility of the physiological forces was demonstrated; such a coincidence as would have, not long ago, been attributed to the conjunction of some celestial bodies, and such as we now refer to the concurrence of ideas in the brain of co-thinking humanity. By this coincidence, at the same time that the doctrine of the unity or correlation of forces was making its entry into the physical sciences like a revelation, the unity of the metro-decimal system was offering for the first time the possibility of measuring mathematically the material world, solid,

liquid, gaseous; also the imponderable motion, the velocity of light, of sounds, of centripetal and centrifugal nervous or electrical currents; even of noting in figures the intensity of the action of thoughts and sentiments on the circulation, calorification, and innervation. There is where we stand. It does not belong here to inquire into the causes why physicians have neglected so long to turn to advantage this mathematical link of all phenomena as soon as it was formed; it would be more interesting to search why some nations have, so far, refused to enter into the metric league, which is the key to these calculi; and more curious yet, why those physicians who have accepted it for common use have neglected its methodical applications. But it will suffice here to establish the concurrence of these three facts, the invention of so many instruments of positive observation; the demonstration that all the human energies are expressions of a unique synergy; the unification or convertibility of the morbid quantities in metric figures or traces; that this concurrence is so striking that, from their simultaneous use, would come out a system of medicine, that this system would have for means of execution the instruments of positive observation, for principle the theory of the unity of the forces, and for control the metric records.

It was, after fifty years of aspirations, expectations, trials, experiments, partial inventions and discoveries, the "numerical method of observation" looked for and predicted by Louis, Andral, and their associates; but it was much more than they had dared to anticipate, as we shall see presently.

The numerical method of observation was ready for use as soon as the metric instruments were ready, and a plan of uniform registration of the metro-decimal quantities presented. To that effect a metric handbook ought to be constantly in readiness to inscribe the metric observations as soon as obtained. The physician who cannot give ten minutes to each of his observations (and to the first much more) must not undertake the case, says Wünderlich. When this *vade mecum* register is regularly kept and written before the patient (as bedside notes) during several days, morning and evening, or oftener if need be, one has under his eyes a series of metric figures which, separated, indicate the happy or fatal progression, and which, brought together and compared (by a power that the metric unity alone can give to heterogeneous quantities), signal the complications to be dreaded,

and admonish of impending crises. The all together without verbiage: a few figures to be written under a few printed words.

There is the ledger, or balance-account by debit and credit of the vitality intrusted to the physician. Of this capital, life, we owe an audit in any case, and if it perish during our therapeutic operations, we must be ready to render of it, and of every part of it, a mathematical account. Therefore, among the advantages of these mathematical records, let us put, on the first plan, the guarantee which they offer equally to the physician and to those who have recourse to his arts, viz., at whatever moment of a treatment, or after, at whatever distance from each other may live the patient and the doctor, the former will be able to communicate a copy of these records to his new physician, who shall use it as a beacon against new errors; and the old physician will keep the original to cover his own responsibility, to testify to the extent and value of his services, to criticize his own doings, to prepare many monographs and to write a few, and to keep his own progress on a level with those of his profession. In them are deposited the metric quantities of the aberrations of function, the augment or decrease of the *calor* produced, evolved, or retained; the loss of weight, of blood-corpuscles, of hæmatine, etc.; the alterations of form (waves) and number of pulse-beats, of the respirations, secretions, excretions, like urea, albumen, sugar, etc., and on them we are enabled to read in figures the extent and variation of the disorder in each disease, so called. If we add to these pathological figures those furnished by the same metric measuring of the effects of the medicamenta, we can say that we treat our cases with a scientific unity of plan, and that not only by so treating isolated cases, but by collating, line for line, these metric cases, we could soon learn the true natural history of the great scourges and their best prophylactics, and will have soon prepared the materials of a mathematical nosology. Lastly, the medical statistics of the world could be summed up in a few hours by bringing together, in agreed centres, a copy of the page of these records which contains the number of patients, the numbers of each disease, their duration, with data, issues, treatment, etc.

The degree of attention so far paid to those connected ideas cannot be fairly estimated by either partisans or detractors, but may be guessed by the number of *Records of positive observation*

issued. This "record" has had twenty-five editions, one of 5000 copies here, one in England, one in France, one in Italy, a counterfeit in Paris, and another in Cincinnati. That is a small number of copies for a large number of physicians; whence it appears that even the most progressive men who use daily the microscope, the thermometer, the test-tube, etc. do not keep mathematical records of their mathematical observations; or, if they do, it is in an isolated and uncomparable, therefore almost fruitless manner. Let us face this evil.

We have analyzed the modern elements of progress of our art: 1. The desire of a revival of Hippocratic observation. 2. The application, to this revival, of the instruments and methods of positive diagnosis, numerical and graphic analysis. 3. The doctrine of the unity of the forces substituted by polydynamics in physiology and pharmacology. 4. The metric system applied to the calculation of all quantities evolved, counted, or traced with the instruments of positive observation. 5. The plan of record which embraces the above elements in a vast system of medical mathematism.

In contrast let us name some of the centrifugal forces opposed to the advent of mathematical uniformity in medicine: The inertia of habits in the old, and (more aggressive), the inhibitory process of young automatism; none being so old as the young reactionary; the opposition to the metric system of medical newspapers, which are the advertising mediums for books mutilated from the metric to the Gothic system; the want of metric teaching, and particularly of metric training in most of our public schools; the organization of many medical colleges in lecture departments, between which there is no time or place for the practical teachings of the metric system, for the education of the medical senses, for the training in the use of the philosophical instruments of modern observation, for practical instruction in the medical book-keeping and book-reading of the fluctuations of the phenomena of life, etc.

Supposing that these anæsthetizing forces would not recede, there is another force at hand that will dissolve them; it is the force of cohesion inherent in the principle of uniformity—a force as unique in itself as multiple in its adaptations:—

(*a*) Now that pharmacists have acknowledged that principle in their Congress, are preparing a universal pharmacopœia, and teach the metric system in all their colleges, physicians cannot

continue to prescribe in heterogeneous doses, nor medical colleges continue to refuse to teach the metric system. It must be taught, and, once learned, no other quantitative language will be used in medicine.

(*b*) Now, again, physicians cannot practise safely for their reputation, as well as for their patients, without the support of the evidences furnished by the instruments and methods of positive observation, as follows: The fever-thermometers, to tell the degrees of pyrexia and its progressions; the surface-thermometer, if a local paralysis is imminent, recent, or of long duration, cerebral localizations, etc.; the spirometer, to mark the extent of the breathing area of the lungs; the dynamometer, which side is weaker, and if muscular action is on the increase or on the wane; the galvanic and faradic excitors of contractility; the æsthesiometer, determining the regions of insensibility or of hypersensibility; the plumb-line, showing the deviations from the vertical, and the plumb-belt, giving prominence to sectional deformities, reproducible on a plan with the pantograph; the stereograph of Broca, permitting to present on the same plan opposite sides which could not be compared otherwise; the various compasses and scales to ascertain thickness and weights; the chemical tests of secretions, excretions, exhalations, etc.; the microphone, microscope, hæmatométre, spectrum, and other instruments which reach far beyond the senses; the optométre and phakométre, measurers of vision, and the ophthalmoscope, which tests also several nervous affections; then the watch, so long the only instrument of positive diagnosis of time in functions—now assisted by the metronome, to detect the anomalies of time in the circulation and respiration; and lastly (without pretence at enumeration), all the self-registering comptors, and graphic instruments of diagnosis whose type is the sphygmograph.

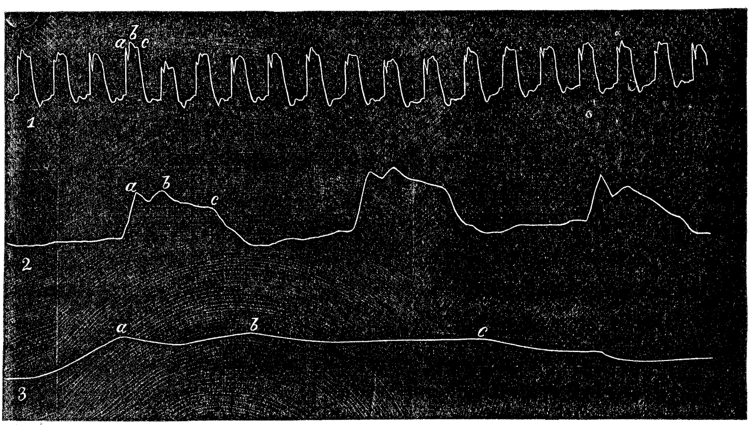
(As we must always prevent imputations, especially the absurd ones, I will say that) all these instruments of positive diagnosis are not required in every case, but might be in any case. We must be ready for them, and they for us. But are we ready for them, if we have not mastered their mathematism? Are they ready for us, if their anarchical mathematics hide the unity of disease under the multiplicity of isolated symptoms, and distract and scatter our effects from the common focus of positive medicine and anthropology? This question does not

touch us alone; the men who have done the most for its solution are yet at work,—to bring it to perfection.

Thus, the inventor of the greatest number of instruments of positive diagnosis, and of the most ingenious graphics used in the physiological laboratories, is yet at work to make them give metro-decimal results concordant with the other data of medical mathematism. In pursuance of this aim, Marey gave me a note on *Uniformity of Graphic Records*,[1] to be used at the International Medical Congress of 1879. The same cause which prevented its publication in full at Amsterdam obliges me to print only an extract of it here:—

"The graphic method, whose application now extends from experimental physiology to physic, will not have acquired its full value until an agreement is entered into between those who use it, in regard to the measures, times, and rules of its *modus operandi*.

"The most important reform would be the making of an agreement in regard to the uniform scale of the time of a graphic operation. For, the tracing of a given act taken on a paper running at a certain speed of a chariot, will differ entirely from those taken at different speeds, as shown by the figure.



"These three tracings are of the pulsations of the heart of a subject taken with the same apparatus, but where the papers were on chariots running at different speeds. That is why the

[1] This remarkable paper can be found in the Archives of Medicine, published by G. P. Putnam, New York, April, 1880.

undulations A, B, C, though common to the three tracings, give lines which differ so much as to have lost the characters of their identity. . . . .

"It is equally necessary to agree upon what the speed shall be. . . . For usual experiments made upon man in health, and observations in disease, I think a unique speed of the chariots carrying the paper would suffice, and that the best would be that of 0.02 m. (or 2 centimetres) per second, which is easy to obtain with precision.

"I submit these suggestions to physiologists and physicians with a degree of earnestness, since the more we work without uniformity of measures of time, the more we prepare elements of chaos, instead of elements of science. . . . ."

Thus what the ingenious savant is working at, all the time, is part of what we are here contending for. This explains the warm expression of interest he manifested in the following note:

COLLÈGE DE FRANCE.

PARIS, 16 juillet, 1879.

MON CHER CONFRÈRE:

Je regrette de ne pouvoir me rendre au Congrès de Cork. J'aurais étê heureux de vous applaudir dans votre belle enterprise d'unification des mesures dans les sciences médicales. Vous réussirez, j'en suis sur, et cela prochainement. Pourquoi ajournerait-on l'adoption d'une mesure dont la nécessité devient chaque jour plus impérieuse? Je vous adresse tous mes vœux avec l'expression de ma respectueuse amitié.

MAREY.

It was my intention to avoid even the appearance of an appeal to authorities in a question which I wish to carry on the strength of its own merits, and by the power of this Association to judge with its own criterium. But, on another hand, and at the last moment, I do not feel at liberty to cripple the cause I mean to serve by severing from it the conformable opinions of men who, besides their high personal worth, are the leaders of positivism in one or another department of physic. Therefore, I will quote only such whose omission could be reproached.

PARIS, 13. 7. 79.

DR. E. SEGUIN.

TRÈS HONORÉ CONFRÈRE:

N'hésitex pas à la dire à la British Medical Association que les livres de chimie théorique et même de chimie technique sont aujourd'hui, dans tous les pays du monde et même en Angleterre, écrits dans le système décimal, et qu'il devient urgent que les corps médical anglais ne fasse plus de résistance à son

adoption pour les usages de la médecine et des pharmacopées ; car cette résistance empêche bien des progrès, elle n'a aucune utilité ; c'est un reste de barbarie qu'il est bon de faire disparaitre, et le plutôt possible.

Je souhaite que vos efforts soient couronnés de succès, en Angleterre comme aux Etats Unis de l'Amérique du Nord, et je vous prie d'agréer l'hommage de mes sentiments de haute estime et d'affectueux respect.

C. MÉHU, D. M.,
Pharmacien en chef de l'hôpital Necker.

MODÈLES CLASSIQUES D'ANATOMIE,
PARIS, le 19 juillet, 79.

MON CHER DR. SEGUIN :

Nous serions ravis que vous réussissiez à faire accepter le Système Métrique aux Médecins Anglais et Américains. Pour les Modèles qui servent à l'enseignement de l'Anatomie les Mesures anglaises sont un obstacle inextricable, et les faire disparaitre sera un bienfait pour tout les Ecoles.

AUZOUX, D. M.,
et son Collaborateur, F. G. LEMERCIER, D. M.

VARENNES, PAR MANDRES,
30. 7. 79.

DR. E. SEGUIN.

CHER CONFRÈRE :

L'utilitê d'une vaste enquête touchant les sinistres qui frappent la vie humaine est partout sentie. Cette enquête est en pathologie générale ce que les enquêtes atmosphériques sont à la nouvelle météorologie, qui a déjà donné de si beaux résultats. Ni l'une ni l'autre de ces enquêtes ne sont possibles qu'à la condition d'user partout des mêmes instruments êchelles poids et mesures. Sous ce rapport la tenacité des médecins Anglais à garder leur gothiques poids et mesures présente une inexplicable et déplorable anomalie. Sans uniformité de poids et mesures entre nations, pas de statistique médicale ; sans statistique médicale, pas de médecine générale ; et sans médecine générale, rien qu'empyrisme. L'œuvre moderne des médecins est de substituer à l'empyrisme l'histoire naturelle de l'homme, à laquelle, sous le nom de Demographie, j'ai consacré mes études.

A. BERTILLON,
Chef des travaux statistiques de la ville de Paris.

PARIS, le 21 juillet, 79.

MONSIEUR ET TRÈS HONORÉ CONFRÈRE :

Vous avez entrepris une œuvre généreuse et éminemment utile. Tous ceux qui aiment la science et se préoccupent des progrès de la société civilisée sont avec vous. En effet, quoi de plus important que de renverser les barrières qui nous séparent ?

Nous employons dêjà les mêmes chiffres et le systême décimal. Vous voulez l'unité de poids et de mesure. C'est un second pas. Un jour viendra peut-être où tous ceux qui auront à exprimer des faits scientifiques emploieront la même langue.

Quand à la réforme que vous allez introduire, elle est tellement nécessaire en microscopie qu'il est presqu'inutile de le dire et qu'elle est dêjà faite en grand partie.

Veuillez agréer, Monsieur et honoré confrère, avec mes meilleurs compliments, l'assurance de ma considération la plus distinguée.

L. RANVIER,
Professeur d'Anatomie générale au College de France.

SOCIÉTÉ D'ANTHROPOLOGIE DE PARIS.
PARIS, 23 juillet, 1879.

MONSIEUR ET CHER CONFRÈRE :

Je n'ai plus besoin d'insister auprès de vous sur la nécessité de l'adoption générale du système métrique en Médecine. Vous developpez mieux que personne l'intérêt qui se attache à cette question sous le double rapport de la science médicale, et de la santé publique, qui dépend de la sureté des prescriptions.

Mais il y a un point de vue que je tiens à vous présenter : c'est celui qui concerne l'anthropologie. Les métrologies locales sont encore usitées par les médecins dans plusieurs pays ; mais il y n'y a plus maintenant dans le monde entier qu'un seul pays où les anthropologistes aient refusé d'adopter le système métrique : c'est l'empire britannique. L'anthropologie positive repose pourtant avant tout sur la craniométrie et sur l'anthropometrie. Les anthropologistes anglais, en continuant à experimer leurs mesures en pouces et $\frac{1}{8}$ ou $\frac{1}{10}$ ou $\frac{1}{12}$ de pouce, et leurs pesées en livres et onces *troy* ou *avoir-du-poids*, se créent des difficultés arithmétiques, s'exposent à des confusions qui se produisent non seulement à l'étranger, mais quelquefois même entre eux, et se tiennent, par rapport au reste du monde, dans un état d'isolement très puisible au progrès de la science.

Veuiller agréer, Monsieur et cher confrère, l'expression de ma considération distinguée.

Le secrétaire général,
BROCA.

CHAMBRE DES DÉPUTÉS,
PARIS, 17. 7. 79.

MONSIEUR ET TRÈS HONORÉ CONFRÈRE :

J'applaudis des deux mains à votre tentative d'unification en matière de poids et mesure dans le domaine médical. Nous avons obtenu en France de tels avantages de l'emploi du système métrique que nous devons désirer vivement le voir mettre en usage à l'étranger. C'est du reste une chose déplorable que d'être obligé, en lisant les mémoires scientifiques des diverses nations, de traduire même les chiffres ; c'est bien assez des mots !

Votre bien devoué confrère,
PAUL BERT,
Professeur de Physiologie à la faculté des sciences de Paris.

Je m'associe complètement aux conclusions de M. le Professeur Bert.

CHARCOT,
Professeur de maladies nerveuses à la Salpétrière.

The following note was dictated and signed as a last effort when its venerable author was not expected to live:—

MENIL-LE-ROI, PRÈS MAISON-LAFITTE, SEINE ET OISE,
19 juillet, 1879.

CHER MONSIEUR SEGUIN :

Je suis tout disposé à vous venir en aide, car votre idée d'aujourd'hui (l'uniformité internationale en médecine et en pharmacie, et préablement l'adoption partout du système métrique) est bonne, comme l'était celle d'autrefois (d'enseignement de la thermométrie humaine aux femmes, pour qu'elles puissent l'appliquer dans les familles, dans les écoles et dans la société) . . . . Mais l'age de 78 ans passés n'étant pas celui des convalescences faciles, je ne puis vous en dire davantage. Acceptez mez regrets. Je vous serre la main.

E. LITTRÉ,
de l'Institut de France, etc.

These letters need no comment; their unanimity and simultaneity show a consensus worthy of reflection. The men who wrote them stand high, each one in his own walk of science; yet they pronounce an identical verdict: *The metric system is the universal language of science; medicine must be ruled by its mathematism.*

I do not want you to be influenced by names—myself the reverse of a worshipper of names—I beg you to consider this array of authorities (to which I could have added many more) as secondary to, but confirmatory of, the array of facts I have previously presented in their philosophical chronology. You have seen that the *need* of mathematical thoroughness was expressed early in this century by men of great sagacity and foresight—one of them yet a living witness among us: That the discovery of the unity of the forces, and of the uniformity in the means of calculating them, has passed from physics to experimental physiology, thence to practical medicine: That, in virtue of these discoveries, we are no more at liberty to practise the conjectural art which was the glory or the shame, the burden of our fathers: That if on one side it has become impossible to practise medicine without being able to resort to all sorts of analyses which have a mathematical basis—on the other side it would be worse than futile to make these analyses in the mathematical English cacometry; and safer to stop observing at once, sooner than accumulate an avalanche of irreducible figures which raises as it descends upon us: That the solution of the problem which your delegates had to investigate rested on the means of rendering easy the acceptance of the metric system and kindred conformities inter nations.

The President of the Metric Executive Committee will submit to you his views on these obligations; and from abroad, the Foreign Delegation begs leave to indicate the advantages which would result from establishing closer and more permanent intercourse with the medical organizations of Europe.

To that effect, we would suggest: 1. That the choice of the Annual Delegates be made, not only for their high character, but in view of their possibilities of working in the interest of this Association. 2. That our President be invited to qualify as Special Delegates the most noted American medical scholars studying at some important seat of learning, with the duty to report to this Association on the progress they witness, which could be engrafted on our schools and the profession at large; and so rendered as fast as possible international.

EDOUARD SEGUIN.

REPORT OF LAURENCE TURNBULL, M.D., OF PENNSYLVANIA, SECRETARY OF THE AMERICAN DELEGATION TO THE FOREIGN SOCIETIES.

TO THE PRESIDENT AND MEMBERS
OF THE AMERICAN MEDICAL ASSOCIATION.

ACCORDING to the instructions conveyed in the circular letter received from your body, we presented ourselves at the ancient city of Cork, August 4th, 1879, and were received with great courtesy by the President and members of the British Medical Association. The various members of the medical profession, with the Mayor, ex-Mayor and citizens of Cork, did everything in their power to make the 47th annual meeting of the British Medical Association a perfect success. The American Delegation owe especial thanks to the President, local Secretaries, and particularly to the Honorary local Secretary, Professor H. Macnaughton Jones, for his warm and generous hospitalities, his untiring zeal, and successful efforts in adding to the comfort and general harmony of the meeting.

The following is a list of the delegates from the American Medical Association: Drs. Lewis A. Sayre, E. Seguin, Beard, and Gray, of New York; Dr. Hodgen, of St. Louis; Drs. L. Palmer and Yandell, of Louisville; Dr. Byford, of Chicago; Dr. Robert Battey, of Georgia; and Drs. Da Costa and Turnbull, of Philadelphia.

First General Meeting of Members, Tuesday, August 5, 1879.—The President, Dr. Falconer, of Bath, occupied the chair. After the reading of the minutes by the general Secretary, the retiring President made a short address on the more salient occurrences in the Association during the year, and stated, in conclusion, that the total number of members was 7800. At the close of the President's address, Dr. Sullivan, President of Queen's College, introduced the President-elect, Dr. Dennis O'Connor, who took the chair, and delivered his address as

follows: "When several thousand men, many of them the most distinguished and honored in their profession for genius and learning, are banded together for one common object, we will readily assume that object to be large, comprehensive, and benevolent; and what purpose of greater magnitude can occupy the human mind, or stir the human heart, than the effort to lighten the burden of sickness or misery, and to defer the inevitable death in which we all have a common inheritance? In forwarding this work, we follow our instincts as men, obey our duty as physicians, and receive a divine sanction as Christians. It can then be well understood how so many, leaving their homes, cross the seas or ocean, and come here to unite in this common brotherhood of benevolence. I only hope the success of this meeting, by increasing our knowledge and diffusing throughout the entire medical community sound principles to guide our actions, may be the result of their sacrifices."

The President's address was the effort of a master-mind in the profession, and full of wise and judicious counsels, beginning with a brief reference to the city of Cork, with its numerous charitable and benevolent institutions, and to the social and moral condition of its inhabitants, and concluding as follows: "It is not a humiliating office for the physician to study the means by which nature accomplishes her ends, and, as far as his knowledge permits, to imitate her. I know the assertion 'of a *vis medicatrix naturæ*' is now nearly obsolete, and equally so the seeking of primary causes for vital phenomena. These old-fashioned ideas have been extinguished by modern philosophy, which asserts that all organizations and its operations are the result of blind chance, without a mind to fashion or guide them. The physician, with his opportunities for observation, must be blind, indeed, who does not see beyond this darkness a clear light, showing him that all nature has been conceived and formed in beauty and order, the result of Divine purpose directed by Divine benevolence."

Section of Medicine.—The first paper read was on "Mountain Air in the Treatment of Phthisis," by Dr. H. Bennett. His objection to mountain regions in winter in Europe for any invalids is, that from eighteen to twenty hours in the twenty-four must be spent in stove-heated rooms, and in bad weather the entire twenty-four. On the north shores of the Mediterranean, as on the plains of Central America, the phthisical patient may live in

an atmosphere of pure air, with windows more or less open, all the winter, day and night.

Dr. George M. Beard, of New York, read a paper on "Inebriety and Allied Nervous Diseases," and stated the disagreeable fact "that there is no country in the world where there is so much total abstinence from drinking, and at the same time so much inebriety, as among the people of the northern and eastern parts of the United States. Inebriety is," he stated, "to be treated on the same principles as other nervous diseases of the same family to which it belongs, that is, first by keeping the patient away from the exciting causes, and secondly by fortifying the system with sedatives and tonics. For very many cases asylums are indispensable. The best law on the whole is the law of the State of Connecticut, which is very similar to the 'Habitual Drunkard' act which has been passed by the English Parliament."

Dr. Wm. Squire followed with a paper on the "Treatment of Rheumatism by means of Iron and Salicylic Acid in the Form of Salicylate of Soda." The conclusions arrived at, after a free discussion of this paper, were, that there was no suitable criterion whereby to determine the therapeutic effects of any drug upon rheumatic fever; that while the influence of salicylic acid, and its compounds, removed somewhat speedily the *malaise* of which the rheumatic sufferer complained, it was extremely doubtful whether they in any degree diminished the peril of secondary, cardiac, or other inflammatory complications.

Several papers were read on alcohol in fever: by two physicians from Scotland, and one by an Irish gentleman holding extreme views on both sides, and yet there was a union of their views that alcohol was valuable in the treatment of fevers.

Dr. Morell Mackenzie, of London, then read a very valuable article on "Laryngeal Phthisis." He stated that to the naked eye appearances of laryngeal phthisis cannot be relied upon; but with the history of loss of voice, and an examination by the laryngoscope, there will be found pale pyriform swellings of the aryepiglottic folds, and a pale turbid-like thickening of the epiglottis, more or less uniform, and small, scattered ulcers, which are the characteristic features of the disease. The prognosis is always unfavorable, the ordinary duration of life after the throat-symptoms have become troublesome being from twelve to eighteen months. The only treatment which is of any use consists in

the employment of palliative remedies. Where there is pain in swallowing, insufflation of morphia with powdered gum arabic gave the greatest amount of relief.

Second day at 11 *o'clock.*—The second general meeting of the Association was held, Dr. O'Connor, President, in the chair.

Dr. Alfred Hudson, Regius Professor of Physic in the University of Dublin, then read an address on "Medicine." Dr. Hudson was evidently a great favorite, as he was received with great applause by the audience. He reviewed the earlier history of medical progress, and dwelt at length on the work done by the celebrated French physician Laennec, giving his views, and contrasting them with those of modern observers, especially Niemeyer.

Subsection of Otology, Wednesday, August 6th.—The work of the subsection was opened by Dr. Cassells, of Glasgow, with the following remarks: "We are met to discuss the subject of otology in general, separated from the other sections into which the work of this Association is divided. It is, indeed, a memorable occasion, seeing that this subject of otology has received to-day, for the first time, a distinct recognition in the proceedings of any medical congress in this country. On the continent of Europe and in the United States of America it has long been distinctly recognized in every great medical gathering. That it should have remained unrecognized till now in Great Britain, where scientific aural surgery had its birth and still has its home, notwithstanding the immense and valuable labors of our *confrères* on the continent of Europe and America, is to me inexplicable. For Saunders, who, in the early part of this century, laid down the principles of conservative aural surgery, for the first time in the history of otology; Toynbee, who laid the foundation of aural pathology, and may justly be called the father of British aural surgery; Wilde, who advanced the subject of aural therapeutics as no one had done before him; and Hinton, who gathered up the sum of the labors of his predecessors, so that it has been said of his works in this department, that 'they will serve as stepping-stones for others to rise upon,' had not the satisfaction of seeing the subject of otology recognized as it is, happily, for us to-day. We have to elect a chairman of this subsection. I shall not detain you longer than to say that our choice has fallen upon a gentleman who is well known, not only in his native country, but all the world over, as one who has advanced,

not only the subject of otology, but science in general. I allude to Dr. Laurence Turnbull, of Philadelphia, and I propose that he be requested to preside this day over the labors of this subsection."

The proposition having been seconded and carried unanimously, Dr. Laurence Turnbull took the chair, returned thanks, and said: "I return you my most cordial thanks for the honor you have done me in electing me the chairman of this subsection. I do not accept this as a compliment to me alone as an otologist, but as an expression of kindness and good feeling on your part to the otologists of the United States, of whom I am the representative. It is true, I have won my spurs in this department, as the larger portion of my professional life has been devoted to its study and practice. It seems perfectly proper at this time to look back to the source whence I received my chief inspiration, and to the fountain from which I first drank its living waters. I can with pleasure refer to the late Sir W. R. Wilde, of Dublin, whose work did more for the advancement of true and scientific knowledge of the ear and its diseases than any of its predecessors; and I am proud also to state that it was at once republished in Philadelphia, and became the standard authority on the subject throughout the United States. Our specialty has made great and rapid advances of late years in Germany, France, Great Britain, and the United States. The true scientific reformation, however, began in Ireland, and I am happy to think that the mantle of the lamented Wilde has fallen upon a most worthy successor."

The first paper read was the "Production of Artificial Deafness, being an Experiment in Physiological Acoustics and its Bearing on the Etiology and Evolution of Diseases of the Ear," by J. Patterson Cassells, M.D., of Glasgow. The object of this experiment was to show that a disturbance in the tympanic tension not only causes defect of function, but tissue changes as well. The experiments employed for the purpose of disturbing the tension of the tympanum were the Valsalvan experiment and Maissiat's experiments; and these seemed to bear out the following theory of the etiology and evolution of ear disease: 1. A certain degree of tympanic tension is essential to perfect function—that is, perfect hearing. 2. The essential cause of all the affections of the organ of hearing is a disturbance of the normal

tympanic tension. 3. All the pathological phenomena of the diseases of the ear evolve themselves in regular sequence.

"Throat Deafness associated with Paresis of the Palato-tubal Muscles," by E. Woakes, M.D., of London. This paper set forth a source of deafness from loss of power—paresis—of the intrinsic muscles of the ear, the clue to which is furnished in a coexistent paresis of the muscles of the Eustachian tube and palate. The latter condition, which is readily observed, affords the clue to the existence of the former; the correctness of the diagnosis being established by the identity of the sources of nerve supply of the muscles proper to the ear, and of those of the tube and palate. The symptoms whereby this form of deafness may be diagnosed from other ear affections were detailed, and the paper concluded with an illustrative case, in which the proper remedial measures were given.

Third day.—This was truly a field day of the Association, as shown by the number of members, with a crowded strangers' gallery. Dr. D. C. O'Connor, President, occupied the chair. The first business was the reading the Report of the Medical Reform Committee. The speaker described at length the various efforts at reform in Great Britain, and mentioned the progress made during the past year, which he spoke of as being very satisfactory. (Such a committee would, we think, be very desirable in the American Medical Association.)

Wm. S. Savery, F.R.S., surgeon to, and lecturer on Surgery at, St. Bartholomew's Hospital, then delivered an address, with numerous statistics drawn from his hospital, on "The Prevention of Blood-Poisoning in the Practice of Surgery." The lecturer spoke with the greatest ease and fluency, holding his auditors for nearly two hours, without apparent effort, and with wonderful powers of perseverance and logical acumen. This was one of the finest speeches that we listened to at this meeting. In concluding, he desired to add a few comments, in which it will be seen that he was not an advocate for Professor Lister's method: "In the first place, at the time of an operation, or immediately after, you see nothing is applied to the wound but water; as a rule no *antiseptic of any sort*, provided the surface of the wound is healthy, because I believe that such healthy natural surfaces are in the state best adapted to satisfactory repair; and that, as a rule, in proportion as they are changed by the application of foreign agents, so are the changes which

indicate repair hampered or arrested." At the conclusion of his address a vote of thanks was passed.

Section of Surgery.—The section was opened by Dr. L. A. Sayre, of New York, by a discussion on "The Diagnosis and Treatment of Joint Diseases." He said that he would confine his observations to the joint diseases generally termed scrofulous, such as strumous disease of the ankle-joint, white swelling of the knee-joint, hip-joint disease, and Pott's disease of the spine. All these diseases were generally considered to be dependent on a constitutional dyscrasia. But Dr. Sayre would ask, if this were true, how was it that many patients, after recovery from hip-joint disease, were ever afterward perfectly well and sound? The family history of many of these cases could be traced back for generations without any trace of scrofula, or any other debilitating affection. In Dr. Sayre's experience, disease of the joint is the result of injury, often very slight. If it be a concussion, an extravasation of blood occurs, which undergoes degeneration, and acts as a foreign body, and the cartilage may become loosened and necrotic. Or the injury may be a severe wrench, with laceration of the fibrous tissues and effusion of serum or blood. In either of these instances there is the starting-point of a chronic inflammation, especially if the injury be so slight as not to attract attention, because then the proper treatment is not applied at the time when the injury is received. The degenerative processes going on in and about a slightly injured joint produce constitutional disturbance before the local manifestations attract attention; and hence these local manifestations are regarded as the result of the constitutional dyscrasia. Even in strumous subjects there must be some local injury before disease of a joint can occur. Scrofula will not produce it spontaneously; although scrofula, whether congenital or (as Dr. Sayre believed to be often the case) acquired in consequence of bad hygienic conditions, etc., necessarily develops any disease or accident from which a patient may suffer. In the treatment, the first point to be attended to is the employment of extension and counter-extension, carefully regulated so as to readily relieve the parts from pressure, as indicated by the comfort of the patient. The next great element is rest, as complete and perfect as can be given to the parts. Mercury in very minute doses is a valuable tonic; and iron, cod-liver oil, and quinine may often be added

with great advantage. Friction and elastic compression are also useful in certain stages. If the effused fluid has undergone degeneration, it should be removed by the aspirator. If this cannot be done, the joint should be incised, under the antiseptic spray, and washed and dressed according to Lister's method. If caries or necrosis set in and continue to make progress, exsection of the diseased parts is the only remedy. The subject was discussed by Mr. Owen, of London; Dr. Barton, of Dublin; and Dr. Hodgen, of St. Louis. The latter desired, as far as possible, to settle the difficulty that seemed to exist between Professor Gross and Professor Sayre. Dr. Sayre said that it was "utterly impossible that morbus coxarius could be regarded as being derived from scrofulous parents without some exciting cause." Dr. Gross said that it was impossible that local injury could produce it unless the person had the scrofulous diathesis. Now, it might appear that those two propositions were very different, and yet to him, Dr. Hodgen, it appeared that they were not greatly opposed; for it seemed that Dr. Gross only insisted that, without a constitutional condition favorable to that particular disease, that particular disease could not occur; while Dr. Sayre said that the existence of a peculiar condition of liability to the disease was greatly increased when the individual was subjected to an accident, and that when a certain condition of the system existed, a very trifling injury would cause morbus coxarius.

Mr. R. W. Parker, of London, read a paper on "Subcutaneous Osteotomy in Children." Mr. Parker was attached to the East London Hospital for Children, and would say that, out of a large number of osteotomies performed on children, varying in age from three to thirteen, he had never lost a case; and in only one instance had there been any suppuration. This one exception had been a severe case of erysipelatous œdema, which, however, yielded to treatment, and the boy finally made a good recovery. It was now generally admitted that the cause of genu valgum lay in a hypertrophic lengthening of the internal condyle of the femur, and, although this fact had long been known, it had never occurred to surgeons to utilize the knowledge for the correction of the deformity. Mr. Parker thought that a special acknowledgment was due to Dr. Ogston, of Aberdeen, Scotland, for having thought out this treatment, and for his boldness and success in putting it into practice.

Ophthalmological Section.—"Dressing for Injured Eyes." A paper on this subject was read by Dr. H. Macnaughton Jones, of Cork. He stated that it is of importance to secure rest without either causing pressure on the globe, heating the organ, or preventing the escape ef tears or any other secretion. So, also, a resort to the use of cold dressing was often a dangerous step. If employed, it must be sedulously sustained, and its effects carefully watched. Once commenced, it was difficult to relinquish it. The small ice-bladder or the piece of linen must be changed occasionally. Nevertheless, it often became heated, and was a source of danger. The cotton pad was heating, and required a skilful hand in applying it. It imprisoned the secretion, often adhering to the eyelids. In January, 1877, having seen recorded Dr. Levis's plan of dressing, in the *Philadelphia Medical and Surgical Reporter*, Dr. Jones determined to try it, and since has pursued it almost entirely, especially after cataract operations. He could strongly recommend it. He quoted the description there given: "A few semicircular pieces of black silk are placed on the upper lid, to stiffen it, and cause it to act like a splint, and then a straight piece of the adhesive plaster is superposed from the root of the nose to the cheek. The other eye is also closed the same way. This is much lighter and cooler than the cotton packing usually placed over the eye, and allows all secretions, which are so apt to cause conjunctivitis, to drain away from under the lid, and enables the surgeon to look at the eye and instil artopia without moving the dressing. At the same time it perfectly protects the eye, which cannot be opened, because the stiffened upper lid will not allow itself to be raised." Dr. Jones used a few pieces of isinglass adhesive plaster (Seabury & Johnson's), the lids being closed, from the nose to the external angular process, smoothly and lightly over the upper eyelid, a few more were then placed on the lower eyelid, and then some pieces were brought from the upper to the lower lid, and held in place by a few extra transverse strips. The patients liked the dressing; the upper lid acted as a splint to the wound, and it had all the advantages described above.

The Sub-Section on Otology.—A paper was read on "Intra-tympanic Injections," by Dr. Cassells. The result of his investigation had been to convince him that the use of intra-tympanic medication of the diseased tissues of the middle ear was without value separated from the act of inflation, by which the intro-

duction of the fluids into the tympanic cavity was effected, and he had, therefore, abandoned their use for the last seven years. The good results which were obtained, in his opinion, by those injections, where they were obtained at all, were due to the inflation of the tympanum by the air contained in the fluid, or driven in along with it, and not to the medicated fluid itself. It was not possible to break up adhesions, dissolve mucus, and generally restore the mobility of the tissues of the ear by medicated solutions, such as of zinc, copper, iodide of potassium, chloral, and chloride of sodium, while these tissues themselves, and the mucus contained in the tympanum, outside of the body were found totally insoluble in such solutions as liquor potassæ, absolute alcohol, and nitric and muriatic acids.

A paper on "The Treatment of Non-suppurative Hypertrophic Catarrh of the Middle Ear," was read by Lennox Browne, F.R.C.S.Ed. (London). The author preferred to treat the subject in its broad aspect, because he feared that the discussion of the subject of intra-tympanic injections might give to many the idea that such was the treatment par excellence for chronic middle-ear disease. He quoted from authorities to show how many aurists had abandoned this measure, and how many more had found it necessary to either greatly limit the cases in which they pursued it, or to reduce to a minimum the strength of the fluids used. He then proceeded to show objections to the procedure alike on physical, anatomical, physiological, and practical grounds. Quoting at length from Wreden, of St. Petersburg, who had made most complete experiments on models, as well as on the dead body and on the living subject, it was urged that, to send fluids in the form of drops or as sprays, it was necessary to pass the instrument through which they were introduced quite within the tympanum, a proceeding of great danger, being liable to injure the ossicles, and certain to set up suppurative inflammation of the drum; or at least to pass the instrument far beyond the isthmus. But fluids could be driven *en masse* by great force, this also being a measure only more dangerous than the other. The anatomical relations of the tympanum were pointed out, and it was shown how much danger there was of cerebral inflammation, of jugular phlebitis, of mastoid or labyrinthine suppuration, or of facial paralysis, if an acute catarrh were induced. Stating how invariably severe were the symptoms when fluid really entered the tympanum, Mr. Lennox

Browne expressed his belief that, when authors reported that they had never had a bad result, such an experience showed that the injected fluid had never passed beyond the isthmus of the Eustachian tube. Again, there was the physiological objection. The tympanum was an air-cavity, whose office was impaired by the presence of a very little mucous fluid, when such was effused as a result of disease. It was often very difficult to disperse this fluid, and there was a great tendency for the lining of the cavity to become thickened, and, as a natural consequence, for its absorptive properties to become diminished. Why should one expect medicated fluids (necessarily, for safety, of very feeble quality) to have a good effect, and why not a bad one, considering the injury done by simple water when it entered the tympanum, as in bathing or on use of Weber's douche? And supposing these fluids were not absorbed, nothing but harm could result, as many authors, Kramer and Bonnafont among the number, had agreed. When one considered the intimate relation of the mucous membrane of the throat and middle ear, and how frequently topical applications of strong mineral solutions failed to cure hypertrophic inflammatory conditions in the former region, what right had we to suppose that these feeble fluids would do good to similar affections of the middle ear? On all grounds, therefore, Mr. Browne objected to this treatment. He stated that after their use he had never, on subsidence of the increase of bad symptoms—in his belief the only proof of entry of fluid into the tympanic cavity —found the slightest gain of hearing power. On the other hand, he had often seen most alarming inflammation induced. If, therefore, they were to be employed at all, he could limit their use to suppurative cases in which there was already a pervious tympanic membrane, or he would, at the time of making them, perforate the membrane, a procedure now established as free from danger. The speaker concluded by pointing out that, by means of inhalations, Valsalvan, Politzer, and catheteric inflations, with either pure air or medicated vapors, by use of the postnasal douche, by faradisation, by use of the exhausting speculum (an improvement of Siegel's instrument being exhibited), and, lastly, by careful attention to the constitutional diathesis of each individual case, it was possible to greatly alleviate—he doubted if they were ever cured—the conditions under consideration.

Dr. Cassells disapproved of the treatment, not because he feared putting fluids into the middle ear, but because he did not get good results.

The subject was discussed by Dr. Weber-Liel, of Berlin, in a paper on "Intra-tympanic Injections," which was read by the acting Honorary Secretary at the author's request. He said that his experience of sixteen years of aural practice had forced him to give up the idea that it might be possible to cure inveterate catarrh of the tympanic cavity by means of intra-tympanic injections of medicated fluids. 1. The symptoms of catarrh of the tympanum may depend upon extension of a simple catarrh from the Eustachian tube and the pharyngo-nasal cavity; then the latter only must be the object of treatment. In this treatment injections of strong nitrate of silver solutions into the mouth of the Eustachian tube, followed four days afterwards by the use of the air douche, will be found of the best effect in reducing the catarrhal symptoms. But in order to avoid inflammation of the tympanum, not more than a few drops of the solution must be blown in with force, by means of the Eustachian catheter; and the patient must be forbidden to blow his nose till four hours after the injection. 2. Or, secondly, the symptoms of the intra-tympanic catarrh are due not only to a catarrh of the tube, but to a collapse of the walls of the Eustachian canal, dependent on insufficient or paralyzed action of the Eustachian tube muscles. In such cases, not intra-tympanic injections, but the awakening of the activity in the tubal muscles by intra-tubal electricity, must be the treatment, to cause the disappearance of the symptoms of the secondary intra-tympanic vascular stasis and catarrh. 3. Symptoms of congestion and catarrh of the tympanic cavity may arise from alterations of the vaso-motor and trophic nerves and of the sympathetic supplying the tympanic cavity. Dr. Weber-Liel had found solutions of nitrate of silver, corrosive sublimate, and common salt, to produce inflammation and perforation of the membrana tympani. Carbonate of soda, however, had not this effect. Mucus, incrusted and transuded purulent matter, may be diminished by it. Tissue (false bands, for instance) and intra-tympanic adhesions may be softened by it; so that it may become more easy to loosen intra-tympanic adhesions by means of the air-douche, and to cause absorption of hardened masses. For this kind of catarrhal affection, he had found intra-tympanic injections to have a really good result.

The injections, combined with air-pressure, were effected by means of his pharmaco-koniontron.

Among numerous other papers presented to the sub-section, was one on "Tinnitus Aurium," by Dr. Laurence Turnbull, of Philadelphia, giving the statistics of 166 cases in which it appeared as a prominent symptom. Mr. W. D. Hemming also read a paper on the subject. In the discussion which followed, electricity was generally recognized as useless, while hydrobromic acid has a positive value.

Section of Obstetric Medicine.—Dr. George H. Kidd, of Dublin, in the chair.

Dr. Robert Battey, of Georgia, introduced to the Association his use of iodized phenol, already familiar to the American profession.

Dr. E. J. Tilt, though not much in favor of intra-uterine injections, admitted, however, that intra-uterine medication was wanted in the following cases. 1. Incoercible blood-loss, resisting all remedies and menacing life. 2. When life or reason is menaced by the intensity with which internal metritis reacts on the system, rather than by the amount of purulent discharge to which it gives rise. 3. When internal metritis causes an aggravated complication of dysmenorrhœa by menorrhagia independent of ovaritis, and menacing life or reason. 4. Membranous dysmenorrhœa. 5. In habitual abortion, independent of syphilis and ovaritis, and seemingly caused by some morbid state of the lining membrane of the body of the womb. When internal metritis led to dangerous flooding, and in cases of membranous dysmenorrhœa, Dr. Tilt recommended intra-uterine injections with undiluted tincture of iodine. He deprecated the injection of a solution of nitrate of silver in such cases, and in other cases of internal metritis requiring intra-uterine treatment, on account of the severe pelvic diseases and death which had succeeded. In such cases he preferred to place in the womb five or six grains of solid nitrate of silver; but, as he had seen this followed by severe peritonitis, and as he knew this to have caused death, he expressed himself ready to welcome a better plan of treatment.

Dr. Byford, of Chicago, believed that intra-uterine medication could be adopted in a great many instances with safety. When he applied it, he looked a good deal to getting the patient into a proper condition; made her live quietly for some time beforehand; and kept her in bed for two or three days after the ap-

plication, which measures he found to secure success invariably. He thought that the application should be delayed after menstruation. He should hesitate to make an application of nitric acid to the uterus in a case where the canal and mouth of that organ were very much diminished in size ; and he did not believe that this was the class of cases to which it was applicable. This treatment should be succeeded by more constitutional means. He used glycerine and extract of belladonna.

Dr. R. Battey gave an account of 15 cases of Battey's Operation. The mortality had been $13\frac{1}{3}$ per cent. Regarding the results obtained at the end of six months, separating the recovered cases into three classes, there were three cases (*a*) of removal of but one ovary, three cases (*b*) of imperfect removal of both ovaries, and seven cases (*c*) of complete removal of both ovaries, which compared as follows: Morbid conditions wholly disappeared in class *a*, 1; in class *c*, 6: partly disappeared in class *a*, 1; in *b*, 1: not benefited, class *a*, 1; class *b*, 2: too recent to determine, class *c*, 1.

Present Condition.—Perfect health, class *a*, 1; class *c*, 4: comfortable health, class *a*, 1; class *b*, 1; class *c*, 2: not benefited, class *a*, 1; class *b*, 2: too recent to determine, class *c*, 1.

Dr. Graily Hewitt spoke of vomiting in pregnancy. He believed that the vomiting of pregnancy was one of the reflex disturbances produced by resistance to the normal expansion of the tissues at and immediately surrounding the internal uterine orifice. The success that had attended dilatation by Dr. Copeman's method was to be explained in two ways: (1) by the change of the flexed condition of the uterus—which the author had pointed out to be a usual cause of the sickness—to a condition of comparative straightness; (2) by the relief of the compression and condensation of the tissues by the artificial dilatation. Relief from vomiting during pregnancy might be obtained (1) by elevating the body of the uterus, and thereby taking off the pressure at the internal os; or (2) by dilatation of the cervix, after the method of Dr. Copeman. His own opinion, based on observation, was that the postural treatment was generally sufficient.

The President said he had learned at the beginning of his career, from Dr. Henry Bennet's book, that inflammation of the cervix uteri was a frequent cause of the excessive vomiting in early pregnancy; and he had since made it a rule to examine the uterus in such cases, and frequently found the condition

described by Dr. Bennet; and, on touching the inflamed surface freely with the solid nitrate of silver, the vomiting generally ceased.

Dr. W. H. Byford, of Chicago, read a paper on "Treatment of Fibroid Uterine Tumors by Ergot." His positions were—1. When properly administered, ergot frequently very greatly ameliorates some of the troublesome and even dangerous conditions of fibroid tumors of the uterus, *e. g.*, hemorrhage and copious leucorrhœa. 2. It often arrests their growth, and checks hemorrhage. 3. In many instances it causes the absorption of the tumor, occasionally without giving the patient any inconvenience; while, at other times, the removal of the tumor by absorption is attended by painful contractions and tenderness of the uterus. 4. By inducing uterine contraction, it causes the expulsion of the polypoid variety of the submucous tumor. 5. In the same way, it causes the disruption and discharge of the intramural tumor. He said that, in administering ergot in cases of fibrous tumor, the action of the drug would depend on the degree of development of the fibres of the uterus, and on the position of the tumor with reference to the serous or the mucous surfaces; the nearer the mucous surface, the better the effect. A good result might be expected under the following conditions: smoothness of contour of the tumor, denoting uniform development; hemorrhage; a lengthened uterine cavity; and elasticity of the tumor. He would expect large fibro-cystic tumors to resist the action of ergot; and a good result was not to be expected in cases of uneven nodulated tumor, absence of hemorrhage, shortness of the uterine cavity, and hardness of tumor. It was not essential to give ergot hypodermically, though this was a very efficacious method; it might be given by the mouth, in suppositories, etc. If the object were to cause painless absorption of the tumor, the dose should be moderate, and not too frequently repeated; if it were desired to have the tumor expelled, full and increasing doses should be given often, and continued till the object was attained. The preparation which he used was Squibb's fluid extract of ergot. He said, in conclusion, that he disclaimed any expectation that ergot would supplant all other modes of treatment.

The President stated that he had tried the ergot, but had no good result from it in this class of cases.

Dr. J. T. Hodgen, of St. Louis, presented a paper and a specimen of fibro-myoma of the placenta.

On Tuesday, August 5, 1879, there was a reception by the President of the Association, and the Local Reception Committee at Queen's College.

On Wednesday, August 6, a conversazione by the Mayor, Corporation, and citizens of Cork.

On Thursday, August 7, there was a public dinner, which was in every way a success, and the "menu" all that could be desired by the most fastidious epicure. There were some most excellent after-dinner speeches. Without desiring to be invidious, we cannot help speaking in high terms of praise of those of Dr. Alfred Carpenter, in response to the toast of the British Medical Association, he having the happy faculty of always making a good extempore speech; rather a rare gift in England. "Our Guests" was a most witty effort, proposed by Dr. Andrew Clark, and most worthily responded to by Dr. Sayre, of New York.

On Friday, we had two entertainments, a garden party, and a grand concert given by the President and Reception Committee in the assembly rooms, the band and chorus numbering 130 performers. It was highly creditable to the musical talent of Cork, and gave much enjoyment to the delegation.

This is but a tithe of the many valuable papers received, read, and discussed, and of the private and public entertainments, dinners, luncheons, etc., which fully and most agreeably occupied our visit. There were also five excursions: to Killarney, the Blackwater Valley, Lismore Castle, the river, Queenstown and Harbor, Blarney Castle, and Donegal; each one selecting the one which he fancied. Your Secretary, Dr. Sayre, and others had a most delightful ending to our visit by a charming sail up the Blackwater, and lunch at Lismore.

REPORT OF DR. LAURENCE TURNBULL, SECRETARY OF THE FOREIGN DELEGATION AT AMSTERDAM, HOLLAND.

SIXTH INTERNATIONAL MEDICAL CONGRESS.

THE following delegates from the American Medical Association presented themselves: Drs. Lewis A. Sayre, Charles H. Sayre, and E. Seguin, of New York, and Dr. Laurence Turnbull, of Philadelphia. We arrived at Amsterdam Sept. 6th, and proceeded the same evening to the "Zeemanshoop," which is a club of six hundred members of the *élite* of the mercantile and shipping classes of Amsterdam, who had politely given their rooms up to the Committee of Registration. Professor Stokvis received us with much courtesy, and we each inscribed our names for membership of the congress, and for the various excursions and farewell dinner. In the evening there was a reunion of the members of the congress in the grand hall of the Zoological Gardens (Artis). Next day, Sunday, at two o'clock *séance d'overture* took place under the presidency of Professor Donders, of Utrecht, in the *grand salle du parc*, and was attended by most of the *élite* of Amsterdam and neighborhood, both ladies and gentlemen.

The hall was artistically decorated with the colors and flags of all nations represented at the congress, and with shields on which were inscribed the names of the cities in which the former meetings of the congress had been held. The report of the general secretary, Dr. Guye, was then read, and in it were set forth all the labors that had been accomplished up to the time of the opening of the present congress. After the reading of the general report had been concluded, there followed the nomination of the *bureau définitif* or presidents from each country represented. Conspicuous among them were Professors Lister and Ernest Hart, of England, Warlomont, of Belgium, Marey, of Paris, and Professor Sayre, of New York. Professor Donders

ascended the tribune, decorated by numerous foreign orders, and wearing the magnificent collar of scarlet velvet set with jewels, which is worn in succession by each of the chief officers of the congress, and then delivered a most remarkable address, which ranged over the whole field of science, both past and present, reviewing also the important work yet to be done in each of the sections of the meeting just opened. Among other matters, he mentioned the subject of "Ear Disease and Life Assurance," as one of the important subjects before the congress from a social point of view, and to be discussed in the otological section. The address itself was characterized by rare elegance of diction and finished oratory. Professor Donders is a tall, fine looking man, with dark eyes and hair, charming manners, and with a warm and generous heart, and a voice of natural sweetness. He is truly one of nature's noblemen, and one who has honored the specialty of ophthalmology.

At half past eight in the evening the burgomaster and the corporation of the city of Amsterdam gave an official reception to the members of the congress in the Hôtel de Ville.

On Monday, September 8th, the sections were organized, nine in number, and one for a museum or exhibition of instruments and medical appliances, making ten in all. Each of the sections commenced operations at 9 A. M., and terminated at 1 P. M., when there was time for lunch. In all the sections the same form was gone through of nominating a *bureau définitif* before the commencement of the proceedings, and, therefore, the papers were read in the order in which they had been previously arranged, and printed for the members each day, and were obtained at the secretary's office.

As the various sections were scattered over the city, we accepted the kind offer of Dr. Guye, who took us in his carriage to the section of otology, to which our attention was more directly devoted. We found a good assemblage of medical men, who were especially devoted to this subject. The names of the members were as follows: James Patterson Cassells, of Glasgow, Scotland, Lecturer on Aural Surgery in the Royal Infirmary School of Medicine; Alexander Ogston, of Aberdeen, Magnus of Königsberg; Guye, of Amsterdam, who was also the general secretary of the international congress; Giampietro, of Italy; Ménière, son of the celebrated Ménière, of Paris; Professor Doyer, of Leyden; Voltolini, of Breslau; Dr. Van Hoek, of

Nymegen; Dr. Delstanche, of Brussels; Dr. Schüster, of Aix-la-Chapelle; Dr. Victor Bremer, of Copenhagen; Dr. Land, of Amsterdam; and Dr. L. Turnbull, of Philadelphia. Dr. Van Hoek was the president of the section, and Dr. Land secretary. The first paper read was Dr. Cassells' on "Ear Disease in relation to Life Assurance." The paper was in French; the doctor read part of it himself, and the rest of it was read by Dr. Delestanche. It was an elaboration of his original printed paper, published by him some years ago. A full and free discussion followed, some agreeing with the views of the doctor, and some expressing an opposite opinion. Dr. Turnbull took part, and gave his views, *i. e.*, that all diseases of bone were not, as it was stated to be, the result of tuberculosis or scrofulosis alone. He considered that in many cases they were but imperfectly treated trauma or disease of the bones, and often the result of malnutrition, and of improperly treated affections of the bones. In general surgery, this was fully proven by the labors of Prof. Sayre in orthopædic surgery, and Dr. O. Wolf, of Frankfort-on-the-Main, and Dr. Hartman, of Berlin, and his own result in aural surgery. His method consisted in careful removal of the diseased or dead bone, and the application of agents so as to produce a healthy action with constitutional treatment. Professor Voltolini, of Breslau, agreed with his views, and Dr. Alexander Ogston, of Aberdeen, took much interest and trouble to explain them in German.

Dr. Turnbull's paper was then called for, which was printed on the list to be read, "On the Mastoid Region and its Diseases," with Illustrative Cases, but, owing to the non-arrival of the French translation, it was simply read by title, to be published in the Transactions of the Congress. He, therefore, read in its place a paper on the "Treatment of the various forms of Tinnitus Aurium," which was discussed at a subsequent meeting of the Section.

In the general meeting of the Congress, Professor Becker, of Heidelberg, delivered an elaborate address on "The Relation of Eye Diseases to the Localization of Diseases of the Brain," by means of the ophthalmoscope. His conclusions were not very definite. He stated that, although useful as corroborative, it could not be depended on alone. Then followed an address by Dr. Chervin (Paris), "On Stuttering and its Treatment."

In the evening in the Grande Salle of the "Felix Merites,"

Professor Marey of Paris delivered a discourse on "The part taken by different nations in the discovery of the Circulation of the Blood." Then followed a musical *soirée* given by the "Society Hereeniging," in a park which is kept up by private subscriptions for the use of the members and their families, as most of those things are done in Holland. The orchestra numbered some fifty performers, and discoursed chiefly classical music.

On Tuesday, September 9th, in the Otological Section, Dr. Guye read a carefully prepared paper, with illustrations, on the so-called "Ménière's Disease." Dr. Guye takes a new and original view of its successful treatment. Then followed Prof. Doyer, on "Adenoid Tumors of the Naso-Pharnyx," which was illustrated by a number of photographs of patients before and after operations for the removal of these tumors. The method he prefers is that of Meyer, of Copenhagen. There was a number of new instruments and apparatus exhibited of special interest by Voltolini and Delestanche. Dr. Ménière also gave a demonstration on "The Removal of Foreign Bodies from the Middle Ear."

On Tuesday, September 9th, in the third section, "Accouchments and Gynæcology," Dr. Lawson Tait, of Birmingham, gave a demonstration of his new gynæcological instruments. Dr. Thomas R. Fraser, of Edinburgh, reported on the question of a "Universal Pharmacopœia;" Prof. Lister on "Carbolic Acid and its various Preparations;" which was followed by a report on the use of "Hydrobromic Ether as an Anæsthetic, with a report of one hundred cases," by Dr. L. Turnbull, of Philadelphia.

In the general assembly of the Congress, after the sectional reports of the day had been read by their respective secretaries, Prof. Lister, of London, delivered an address in French on his method of "Antiseptic Treatment of Wounds," and controverting the opinion of the opponents of his system. As the professor ascended the tribune, he received a perfect ovation, by all rising to their feet, waving of hats and handkerchiefs, stamping of feet, and hurrahing from hundreds of tongues. In all this excitement, Lister was perfectly calm, with his countenance simply expressive of pleasure, as he bowed his acknowledgments. President Donders, who had been standing during this exciting scene, and evidently enjoying it, then called for silence, and approaching Prof. Lister and taking him by the hand, said: "We give you not only our own homage but the homage of the

nations." This was again the signal for the renewal of the ovation, and the professor again bowed his acknowledgments. It must have been a very proud day both for him and his dear wife, who was present to enjoy it. Then followed an address by Professor Van Geuss, of Amsterdam, on "The Valve of Naegele in the interpretation of the facts having relation to the propagation of the Miasmatic Epidemics."

On the same day there was a féte given in the Volk's Palace or Palace of Industry, consisting of music and Vaudeville in one act, which represented the marriage of "Kloris en Roosje," in which the characters were dressed in the Dutch costumes of the early part of this century.

Wednesday was what is termed the off day at the Congress, and was devoted to pleasuring. The excursion was to Ymuiden and the Zuyder Zee, with a sail through the great Dutch canal into the North Sea at Ymuiden.

On Thursday, Sept. 11th, in the Otological Section, Dr. Magnus, of Königsberg, read a paper on the "Great Value of the Watch as a Means of Testing the Hearing," considering it the most convenient and practical instrument for hearing single and simple tones. Dr. Voltolini and Guye controverted the idea, and advocated the use and utility of the human voice.

In the general assembly Professor Verneuil, of Paris, delivered an address on the "Indications and Contra-Indications for Operations in Surgery." Dr. Drysdale, of London, discoursed on the "Importance of the Regulation of Prostitution on the Public Health," advocating the same.

In company with our friend Dr. Cassell, to whom we are indebted for some of the facts embodied in this report, we visited the Trippenhaus, named after a former possessor, the burgomaster Tripp, also known by the name of the S. Rijk's museum, which was founded under the government of Louis Bonaparte, and is truly a national gallery of the Dutch School.

In the evening there was a conference and lecture by Professor Virchow in the *grande salle* of the "Felix Merites," the subject being "The Recent Excavations of Ancient Troy."

On Friday, Sept. 12th, in the Section of Medicine, Mrs. Dr. Hoggan, of London, read a paper on "The Relations of Carcinoma to the Lymphatic System."

In the Section on Physiology, Dr. Seguin, Sen., of New York, read an important paper on "Education in the Isle of France."

In the Section on Biology, Professor Donders reported on "The Systems of the Sensation of Color." In the same Section, Prof. Marey reported on "The Determination of the Blood Pressure in Man."

In the Ophthalmological Section, Snellen gave his experiments on "The Antiseptic Method in Eye Operations." His first conclusion is, that it is of the same value as in ordinary operations, but the employment of the Lister spray offers insurmountable difficulties in operations on the cornea, and is replaced with success by a current of air purified with carbolic acid.

Among the more interesting demonstrations of the International Medical Congress at Amsterdam were those by Dr. Sayre of his method of treatment of spinal curvature and Pott's disease by suspension and the plaster jacket. The method was already known and successfully practised by a few surgeons in Holland. The brilliant success of Dr. Sayre's remarkable demonstration will undoubtedly contribute to popularize rapidly this invaluable boon to surgeons and patients. The cases included one of a patient wearing one of the recent modern and highly improved apparatus. It was found that the patient stood nearly an inch higher without it than with it, as will often be found on careful measurement after removing any special "instrument," for nearly all, by the downward pressure on the shoulder, actually depress the column vertically, while they exercise lateral pressure on the convexity of the spinal curve. The suspension made, and the jacket applied, the patient, carefully measured by the surgeons present, was found to have gained another inch and a quarter, and moved about with an ease and comfort to which he had long been a stranger. The immediate satisfaction and relief afforded, and the rapid and easy cures of Pott's disease and of spinal curvatures effected by Sayre's method and jackets are now matters of such every-day knowledge and experience that we can readily appreciate the enthusiastic satisfaction with which the demonstration and introduction of this method of treatment were hailed by new audiences of surgeons to whom they are still novelties. Dr. Sayre received the accustomed and well-deserved tribute of enthusiastic approval of the large, crowded, and highly-informed section of foreign surgeons before whom his brilliant demonstration was made. We say accustomed, because the same experience may have been noted wherever Dr. Sayre has demonstrated his method before an audience of medical men, whether at the great

hospitals of London, at the congresses of Manchester, at Liverpool, or at Cork.

On the same day (Friday, 12th) at the Elizabeth Hospital, Professor Sayre gave a lecture and a practical demonstration of his own peculiar method of dressing, which elicited much applause from all present, but especially from the Holland surgeons, who displayed a thorough and careful study of this method, and demonstrated its great value in a number of illustrative cases.

Professor Lister then followed Sayre, and his demonstration consisted in his manner of dressing wounds after removal of a necrosed bone, and other operations. Prof. Tilanus presided, and at the conclusion a vote of thanks was given to each of the professors. In the evening, Prof. Sayre, not to be outdone in accepting of the numerous hospitalities from old Amsterdam, gave an elegant dinner in the name of Young Amsterdam, or the name of the delegation from the American Medical Association, and it was well worthy of the occasion. There was a large number of the distinguished men of the congress present; also representatives of the corporation of the city of Amsterdam, American consul, and officers of the army and navy. The only drawback being that the evening was too short for the many admirable speeches and toasts, many of which had to be cut short, owing to an entertainment which was given to the members of the congress, their wives, and sweethearts, by the medical men of Amsterdam. It was a *fête* in the summer theatre of Van Lier. The nature of the entertainment was a two-act drama entitled "College Schnepper," by "Dr. Supinator Longus." It caused a great amount of mirth, and was enjoyed by all present. There were also two tableaux represented. In one—"The Past and the Present," founded on the picture of Ambrose Paré dressing the wounded on the field of battle—Paré's place was taken by a well gotten-up "double" of Lister spraying his germ-destroying fluid on the wounds of the soldiers. "The Future" was founded on Rembrandt's well-known picture "The Anatomical Lesson," but instead of men surrounding the lecturer, *he* was surrounded by women, the most prominent of whom was Mrs. Dr. Jacobs *in propria persona*, the first and only female medical graduate of the University of Amsterdam. Professor Lister's "double" was received with a volume of applause, to which the professor, seated among the audience, bowed his acknowledgments. The ladies

in "The Anatomical Lesson" were less boisterously applauded, but well received nevertheless.

On the 13th of September, in the Medical Section, Professor Zavertat, of Rome, read valuable papers on "Syphilitic Affections of the Larynx," and on "Bronchial Asthma, from the point of view of its Pathological and Clinical History." Professor Macgillavray, of Leyden, read an instructive paper on the question of "Sympathetic Irido-Choroiditis," in the Section of Ophthalmology.

On Saturday evening the "Farewell Banquet" was given in the Grande Salle of the "Felix Merites;" most of the members of the Congress were present, with all the officials of the City of Amsterdam, and numerous invited guests. After a most sumptuous dinner, with all the delicacies which could be desired, and an abundance of fruits, wines, etc., the regular toasts of every country represented were given by the President, Prof. Donders, in the chair; and, when the United States was toasted, Prof. Sayre made a most telling speech, which was translated by Dr. Guye into French with great facility, and it was received with rounds of applause by all present. Dr. Seguin also made a very good speech, and was in his element in speaking in his native tongue. The members of the Congress and invited guests then ascended to an upper chamber, when addresses were delivered of a farewell character by a special messenger from the King of Holland, and by Virchow to the students, who were there in great numbers, "urging them to perseverance in their studies, and to prosecute them with a pure heart and spirit, seeking for the truth alone, which he declared ought to be their life quest." While he was speaking, his features glowed with enthusiasm. As he said farewell, in a shake of the hand, he sent a kind remembrance to his friend, Prof. Samuel D. Gross, of Philadelphia.

A torchlight procession by the students of the three faculties of the University of Amsterdam, and the singing of the "Gaudeamus," brought this most successful meeting to a close.

On Sunday, September 14th, the Dutch Railway Company provided a special train for the members of the Congress who remained for an excursion to Scheveningen, where there was an official reception given by the municipal commission, charged with the direction of the Grand Hotel des Bains, and by their physician-in-chief, Dr. Ness, who entertained the members at luncheon, after the reception.

REPORT

ON

MEDICAL CHARITIES.

THE ABUSE OF MEDICAL CHARITIES.

[The following Report of "the Committee on the Abuse of Medical Charities," was presented to the Philadelphla County Medical Society on March 24, 1880, adopted by the Society as its Report, and respectfully referred to the American Medical Association.]

REPORT.

The Committee on the Abuse of Medical Charities, consisting of the "Committee on Hygiene and the Relations of the Profession to the Public," with the addition of the following named gentlemen: Drs. S. R. Skillern, R. Burns, W. B. Atkinson, J. G. Stetler, W. T. Taylor, R. J. Dunglison, C. A. McCall, and W. R. D Blackwood, beg leave to present this their final report. The subject, it will be remembered, was referred to the Committee, in the shape of a *Memorial* from the "West Philadelphia Book Club," at the regular meeting of this Society held May 22, 1878. While, therefore, on the one hand the Committee feel that they are not open to the charge of having acted precipitately or with undue haste in this extremely delicate matter, they trust that the amount of work they have accomplished, and the tangible results at which they have arrived, will be considered a justification of their action in delaying their report until the present time.

The Committee considered that their first duty was to ascertain the facts of the case,—whether such an evil as that represented in the Memorial did really exist, viz.: "A wholesale and indiscriminate, gratuitous, medical attendance in connection with the clinics, dispensaries, and other eleemosynary institutions of this city," constituting "a subject of so vast importance and so difficult to overcome, as to require concerted action by the profession generally." This question divided itself into two heads. First, Was the actual number of cases treated gratuitously during any one specified space of time for which records could be obtained, say the year 1877, disproportionately large

when viewed in relation to the population of the city? and, secondly, Is there direct evidence, apart from this general deduction, that persons abundantly able to pay a physician, are in the habit, in any considerable number, of obtaining gratuitous advice at the dispensaries? Sub-committees were accordingly appointed to investigate these questions; the work of the first being again subdivided into the discovery of (*a*) the amount of gratuitous service rendered by College Dispensaries, (*b*) the amount of such service rendered by Religious Dispensaries, and (*c*) the amount rendered by General and Special Dispensaries. The reports of these sub-committees (which are appended to this report, see appendix) appeared to the Committee fully to sustain the complaint of the Memorial, showing that in the neighborhood of one hundred and twenty thousand persons had been prescribed for at the various dispensaries during the previous year (1877) and that instances without number could be cited of individuals, in the possession of ample means, availing themselves of the opportunities provided by the benevolent for the benefit of the poor alone. Fifty-nine such cases were reported specifically, with their residences and incomes. Thus reassured that they had firm ground to stand upon, the next step taken by the Committee was to endeavor to discover to what extent the managers of such institutions were aware of the impositions which were practised upon them, and to obtain an expression of opinion from them and from their medical staffs, as to the best means of meeting the evil, its existence being acknowledged. This effort took the shape of the following circular, a copy of which was sent to the Secretary of each board of Managers, and to the Secretary of each Medical Staff. In taking this step your Committee availed themselves of the experience of the "Committee on the Abuses of Medical Charities of the *New York State Board of Charities*."

QUESTION I. Should General Dispensaries confine their operations strictly to certain geographical limits?

QUESTION II. In order to restrict the benefits of your institution to those who are really poor, should inquiries be made in each case as to the ability of the applicant to pay for medical advice?

QUESTION III. Would it be advisable to establish, as a standard of qualification for relief, the amount of income, rent paid, or general circumstances of the individual applying?

QUESTION IV. Would it be well for you to charge at your discretion a fee, either for advice or medicines, or for both?

Replies to this circular were received from fifteen Dispensaries. They are, many of them, full, and contain valuable suggestions. As a rule it was found that they recognized fully the necessity for repressive measures, but confessed themselves to be without the requisite machinery for undertaking them.

The Committee beg leave to quote from a few of the most suggestive of these replies.

DAS DEUTSCHE HOSPITAL DER STADT PHILAD'A. (GERMAN HOSPITAL.)

"The authorities of our institution have long since recognized the importance of reform in the matter which the Philadelphia Medical Society has wisely taken into consideration, and will cheerfully coöperate with said Society, and the medical charities of this city to effect the desired end."—*Medical Staff.*

MISSION HOSPITAL.

QUESTION III.

"A check of this sort would be an excellent protection against vagrancy could it be attained, but we cannot see how the information could be reached. The statements of patients in such cases we have found to be utterly unreliable, and our information must be derived from some other source."—*Medical Staff.*

WOMAN'S HOSPITAL.

QUESTION II.

"After the first relief has been given if there is any doubt as to the poverty of the applicant, or suspicion of imposture, it is suggested that the name and address of the patient be referred to the respective ward bureau of organized charity, for investigation, and upon endorsement by said bureau, the applicant may return for a second visit and for continued relief."—*Board of Managers.*

CHILDREN'S HOSPITAL.

Question II.

"The plan it is proposed to adopt in this institution is to require applicants, whose cases are doubtful, to bring a certificate of worthiness of relief from some charitable organization of their ward or district as a condition of a second visit."—*Board of Managers.*

Question II.

"Patients should be required to present a certificate from the visitor of the poor in the district he or she lives in, or from the secretary of any well-known charitable organization, or from a well-known citizen, before being admitted for treatment. This certificate to be taken up and filed, so that it could not be used promiscuously."—*Member of Staff of Wills Hospital.*

GERMAN HOSPITAL.

Question II.

"Yes. But as it will often be difficult, if not impossible, to obtain reliable information, we would respectfully suggest that some arrangement might be made with the 'Philadelphia Society for Organizing Charitable Relief and Repressing Mendicancy,' by which information in any given case might be obtained through the 'Ward Associations' of said Society."—*Board of Managers.*

It thus became evident that, with the means at their command, both the managers and the medical officers of these charities felt themselves powerless to control an evil which they knew to be growing under their hands. There was a missing link in the chain, viz., an adequate investigation, which should leave no doubt as to the worthiness of the applicant.

While these replies were under consideration, overtures were received from the "Committee on Out-door Relief of the Society for Organizing Charity," alluded to in two of the replies above quoted, requesting a conference with your Committee, with the intimation that their Society might possibly, through its ward associations, undertake the labor of investigating cases referred to them by the dispensaries for decision. This proposal appeared to your Committe to meet the want. The matter was brought

before this Society at the regular meeting held April 23, 1879, and referred back to your Committee for further information. At an adjourned meeting of this Society, held April 30, the subject was reported favorably, and the conference then authorized. The committees met twice in conference, and after free discussion, appointed a sub-committee, with full power to act, and to report directly to the two societies.

The first act of the sub-committee was to draw up a basis of co-operation of the medical charities with the ward associations of the Society for Organizing Charity. This plan, having received the sanction of the County Society as a tentative measure at the meeting held May 14, 1879, was forwarded to the boards of managers and medical staffs of all the charities in question for their consideration and advice.

At the same meeting this Society gave its sanction to the suggestion of the Committee of Conference, that it was expedient to call a public meeting of the entire medical profession of the city, to discuss the subject, and decide upon some definite line of action which could be accepted by all the parties interested. The summer and autumn months were employed by the sub-committee in holding informal conferences with the medical staffs of all the institutions giving dispensary relief, with the double purpose of explaining to them the suggestions of the circular, and of obtaining a familiar expression of their opinions as to the expediency of adopting them. These interviews established, beyond all doubt, the fact that the attending physicians and surgeons objected strongly to undertake the labor of investigation themselves, feeling that, however great its importance, it was not for that purpose that they offered their services; that it consumed valuable time which could be more profitably occupied, both for the patients and themselves, and that they especially shrank from the inquisitorial character of the work. At the same time they developed not less clearly the fact that those who are most intimately acquainted with the workings of these institutions are the most keenly alive to their liability to abuse, and to the wrong which is thus inflicted, first, and most important of all, on the recipients of the misappropriated bounty themselves; second, upon its benevolent donors; and, third, upon our own profession, ever foremost, as it is, in the Christ-like work of relieving the suffering poor.

Having thus, as they conceived, carried the work as far as it

was possible for them to do unaided, the Committee of Conference issued, with the approbation of this Society, an invitation to every member of the profession in this city to be present at a meeting to be held in the Hall of the Philadelphia County Medical Society on the evening of Saturday, January 24th, 1880, to consider the proposed plan of co-operation, the purpose of which was stated to be "to protect the medical charities and the members of the medical profession from imposition on the part of applicants for out-door relief of hospitals, or for dispensary relief, who have the ability, either wholly or in part, to pay for their treatment; to prevent overlapping in the general dispensaries, and to avoid the lowering effect upon the self-respect and independence of our people, induced through indiscriminate relief."

Accompanying the invitation, in each case, a copy of the plan of co-operation was sent, in order that it might be maturely considered in advance. This plan contained many of the essential features of that at first submitted to the officers of the medical charities, but with decided modifications in accordance with their criticisms and suggestions.

This meeting was presided over by Professor Gross, who, upon taking the chair, explained the objects of the meeting in a short, but pointed address, which showed that he was fully in sympathy with them. Certain of his statements were so remarkable that we feel justified in repeating them, and giving them the weight of his distinguished name. After alluding to the immense crowds which throng our clinics, he went on to say: "At least one-half of these people, if due inquiry were made, would be found to be able to pay something for medical services. If this be so, then nearly one-half of these people are practising a vile imposition upon the bestowers of charity, and upon the medical profession. It is not our wish to strike a blow at charity, but simply to give to charity a proper direction—to draw a line of demaraction between the deserving and the undeserving."

"This subject has, during the last ten years, attracted much attention in Great Britain, and many of the most distinguished medical men, as well as laymen, have taken an active part in correcting, what all right-thinking persons must regard as a great evil, a great and crying shame. It is estimated that in London, in 1873, 1,288,000 persons received gratuitous advice and medicines. In eight of the London hospitals alone, 300,000

patients were thus treated. In the provincial cities and towns the same proportion of pauperism exists. In New York, in 1876, in eleven general dispensaries, 194,000 were treated in-doors, and nearly 10,000 more in their homes. If to these figures we add 21,000 patients treated in the eye and ear infirmaries, we shall have a total of 225,000, or fully one-fourth of the population of that city, receiving free medical and surgical aid. It is asserted by those who are familiar with the facts that at least sixty per cent. of those patients were able to pay a small fee. In Boston, in 1877, 100,000 people, or more than one-quarter of the entire population, received charitable aid in the form of medical attendance. These figures are simply appalling, and are well calculated to arrest general attention. They plainly show that medical men, as well as charitable men, have long been the unconscious propagators of fraud and immorality."

Dr. H. Lenox Hodge, as Chairman of the Sub-committee of Conference, reported the following recommendations:—

FIRST. That all applications for relief shall be made in the first instance at the offices of the Medical Charities.

SECOND. That applicants with families in receipt of $9 a week or more, unmarried persons, receiving $6 or more, and persons living out at service, are able to employ a physician, and should be refused treatment; and that applicants should be so advised through the cards of the Medical Charities, as well as by notices placed on the doors of the service rooms.

THIRD. That applicants who may be admitted to treatment shall be required to pay for their medicine, or to deposit ten cents at each visit in a box provided for the purpose, unless exempted through procurement of a certificate of the ward superintendent of the Society for Organizing Charity, on which the words "unable to pay" shall be noted. This condition should also be placed on the cards and on the notices on the doors of the service rooms.

Dr. Sturgis, of New York, by special invitation detailed the workings of the fee system in the dispensaries of that city, with which he has been connected for several years, having made the defeat of fraudulent mendicancy on medical charities an especial study.

His remarks, which were listened to with great interest, showed most conclusively that concerted action on the part of

the various dispensaries cannot fail to exert a repressive influence on this evil to an unlooked-for degree.

The following resolutions, offered on behalf of the Sub-committee of Conference by Dr. Lee, were then unanimously passed:—

"*Resolved*, That efforts should be made to prevent the pauperizing and enervating influences of undue and indiscriminate medical charity.

Resolved, That care should be taken that the funds contributed by the benevolent to our hospitals and dispensaries are bestowed only upon the poor.

Resolved, That measures be taken to arrange the dispensary system so as to cover the whole city, in order to afford relief to the poor in every part at an office near their homes, and to prevent overlapping in the treatment of cases.

Resolved, That a committee be appointed to carry into effect the plan which has been proposed at this meeting, or such modifications of it as they and the several hospitals and dispensaries may deem advisable.

Resolved, That this committee be called 'The Committee on Co-operation of the Medical Charities with the Ward Associations of the Society for Organizing Charity.'

Resolved, That this Committee be composed of the medical and surgical staffs of the various hospitals and dispensaries, or of representatives from each.

Resolved, That this Committe shall call an annual meeting of the profession for the purpose of hearing a report of what has been accomplished during the year previous.

Resolved, That the officers of this meeting be the corresponding officers of this Committee."

Your Committee, therefore, respectfully recommend that, as the further prosecution of this important reform is in hands which will carry it on wisely and, there is good reason to hope, successfully, the subject of the Memorial of the West Philadelphia Book Club referred to your Committee May 22d, 1878, be left in charge of the "Committee of Co-operation," thus established, for their future action.

By order of the Committee.

Signed, BENJ. LEE,
Chairman,
Committee on Hygiene and the Relations of the Profession to the Public of the Phila. County Medical Society.

APPENDIX.

A Tabular Statement of the number of cases treated at the different Dispensaries of Philadelphia during the year 1877, *as extracted from their published Reports, or based on careful estimates.*

Name of charity.	Dispensary patients.	Visits to dispensary.	Patients visited at their homes.	Number of visits at homes.
Charity Hospital Dispensary	7,644	22,932		
Children's " "	7,600	15,279		
Church Dispensary of Southwark . .	7,231	21,691		
Dispensary for Diseases of the Rectum, etc	70	401	7	35
" " Skin Diseases . . .	370	2,146		
Episcopal Hospital Dispensary . .	12,229	25,163		
German " "	1,185	2,178		
Germantown " "	510	1,206		
Gynæcological Hosp. and Infirm for Dis. of Children	300[1]	1,200		
Homœopathic Hospital Dispensary .	7,384	11,618	1,512	
House of Industry " . . .	3,046	9,139	76	380
Howard Hospital " . . .	7,240	24,516		
Jefferson Med. Col. " . . .	3,500[1]			
Jewish Hospital " . . .	80	240		
Mission Hosp. and Disp. for Women and Children	3,124	5.439	1,041	4,456
Northern Dispensary	14,821	44,463	1,989	9,945
Othopædic Hospital Dispensary . .	806	1,778		
Pennsylvania " "	3,924	17,867		
Pennsylvania Disp. for Diseases of the Skin	413	1,793		
Philadelphia Dispensary	9,667	19,334	1,118	5,590
Philadelphia Dispensary, Obstetrical Department	266	1,082	139	695
Philadelphia Dispensary, Eye and Ear Department	3,260	22,764		
Philadeldhia Ear Infirmary . . .	258	1,004		
" Lying-in Charity . .	70	350	476	2,380
Presbyterian Hospital Dispensary . .	1,532	4,378		
Sisters of St. Francis " . .	2,551	8,040		
Southern " . .	6,484	19,452		
St. Christopher's " . .	1,365	2,860		
St. Joseph's Hospital " . .	1,100[1]	3,300		
St. Mary's " " . .	2,551	8,040		
University " " . .	5,940			
Wills Eye " " . .	4,082	23,574		
Woman's " " . .	6,070			
City District Physician	....	....	3,670	18,350
Total	126,673	328,227	10,028	41,831

[1] Estimated.

A Tabular Statement of Persons receiving Gratuitous Medical Attendance at Public Hospitals and Dispensaries, in Philadelphia, who are in good if not wealthy circumstances; obtained by the Committee from what they deemed reliable sources of information.

Number.	Person attended.	Residence.	Property owned (O), or rented (R).	Assessed value, or rent paid annually.	Ability of the parties to pay	PLACE WHERE ATTENDED. University (U). Jefferson (J). Penna. Hosp. (P). Dispensaries (D). Not definitely known (I).
1	Lady	N. 18th St.	O.	$9500	Ample	U. and Wills Hospital.
2	Family (5)	Vine "	O.	(2 houses) $14,000	"	U. J. and Disp. Skin Diseases.
3	" (4)	N. 21st "	O.	(4 houses) about $12,000	"	U. (frequent visitors).
4	" (3)	" "	R.	$480	Good	Alternate between Hospitals.
5	" (3)	S. 21st "	R.	533⅓	Ample	" " "
6	Gentleman	Broad "	Boarder	(weekly) $25	"	D.U. and occasionally to physician
7	"	N. 22d "	R.	$360	"	Alternate between D.
8	Family (3)	Race "	R.	480	Good	U. and J.
9	" (4)	N. 19th "	R.	525	"	Alternate.
10	" (4)	Mt. Vernon	O.	8000	Ample	"
11	" (3)	Fairm'nt Av.	O.	5500	Good	"
12	" (2)	Brown St.	R.	360	"	"
13	" (6)	Hare "	O.	3000	"	U. and P.
14	" (2)	N. 19th "	R.	480	"	D. and occasionally to physician.
15	" (2)	" "	R.	400	"	D.
16	" (3)	Pine "	O.	3850	"	Howard Hospital.
17	" (4)	" "	R.	365	"	P. and D.
18	Lady	Spruce "	Boarder	(weekly) $18	"	Alternates (chronic disease).
19	"	34th "	R.	$750	Ample	U.
20	Family (2)	S. 16th "	R.	500	"	J. and P.
21	" (4)	" "	O.	5000	"	P.
22	" (5)	S. 18th "	R.	565	Good	U. and D.
23	" (3)	Sansom "	R.	360	"	Alternate.
24	" (2)	Filbert "	O.	6000	"	"
25	Gentleman	Broad "	Boarder	(weekly) $22	Ample	I.
26	"	" "	(same h.) Boarder	(weekly) $25	"	I.
27	"	Walnut "	Boarder	(weekly) $15	"	I.
28	"	" "	(same h.) Boarder	(weekly) $15	"	D.
29	Family (6)	S. 20th "	O.	$5000	Good	U. and P.
30	" (5)	" "	R.	650	"	Alternate, and sometimes physician
31	" (5)	" "	R.	400	"	D. and sometimes, if compelled, physician.
32	" (2)	S. 21st "	O	(about) $5000	"	D., and physician, if unable to move.
33	" (3)	Hamilton "	O.	4500	"	Alternate U. and D.
34	" (2)	Callowhill "	R.	540	"	D. and U. and D. for Dis. Skin.
35	" (3)	Vine "	R.	520	"	Orthopædic and U.
36	" (4)	N. 20th "	O.	(about) $5000	"	Children's and U. Hosp.
37	Lady	Race "	O.	8000	Ample	Wills Hosp. and U.
38	Family (2)	N. 21st "	R.	480	"	Alternate D.
39	Gentleman	N. 15th "	R.	600	"	Alternate D. and Hospitals.
40	Family (3)	S. 12th "	O.	6000	Good	P. and D. Dis. Skin.
41	Gentleman	Bainbridge	O.	4000	Ample	Univ. Jeff.
42	Lady	" "	O.	4000	"	Univ. Pa.
43	"	" "	R.	350	"	Howard Hospital.
44	"	" "	R.	333⅓	"	Univ. Pa.
45	"	" "	R.	280	Good	Alternate.
46	Gentleman	Catherine "	R.	300	"	"
47	"	Christian "	R.	420	Ample	Univ. Pa.
48	"	" "	R.	400	"	"
49	Lady	" "	R.	....	Good	"
50	"	S. Broad "	O.	8500	Ample	"
51	"	S. 17th "	R.	350	Good	"
52	"	Carpenter "	R.	280	"	"
53	"	S. 15th "	R.	360	"	"
54	"	" "	R.	360	"	Jeff. Hosp.
55	"	S. 22d "	R.	....	"	Univ. Pa.
56	"	Delancey Pl.	O.	3500	Ample	Univ. and Wills Hosp.
57	"	Pine St.	O.	4600	"	Univ. and Jeff. Hosp.
58	Gentleman	Lombard "	R.	420	Good	" "
59	Lady	Race "	R.	400	Ample	Wills Hosp. and Disp.

Those marked *Good* as to ability to pay are able to pay readily $200 per annum. Those marked *Ample* are able to pay greatly more than those marked "Good." The above list was collected, and the "assessed value or rent" ascertained from OFFICIAL sources.

There are many other examples under observation, but not determined accurately enough to go into this Report.

The Committee present the following extract from a "*Plan for Co-operation of the* MEDICAL CHARITIES *of the City, with the Ward Associations of the* PHILADELPHIA SOCIETY FOR ORGANIZING CHARITY, *having for its objects an avoidance of the pauperizing effect of indiscriminate Medical relief, and the protection of the Medical Charities from imposition.*"

Both in Europe and in this country very active measures have been established to protect communities from the pauperizing and enervating influences of undue and indiscriminate relief, and to give a better direction of the funds of contributors in reaching the worthy poor. Foremost in this question are the Medical Charities.

London[1] is said to give Medical Charity to one out of every three or four of her population; New York[2] in about the same proportion; Boston[3] to one in four and a fraction; Philadelphia to one in five and a fraction.[4]

Overlapping and duplication in the registration of beneficiaries at the different services, and other conditions, must account for a large exaggeration in this stated ratio; but the evidence of a very large imposition upon the services rendered at the offices of our Medical Charities is justly complained of by our Medical Staffs and by the general profession. The numerous and rapidly increasing attendance of patients at many of the out services of our hospitals and dispensaries, overtaxes the energies of the medical officers, and is a disadvantage to the patient in

[1] Dr. Joseph Rogers, British Medical Journal for May 27, 1871, and Reports of five Sub-committees of Physicians.

[2] First Report of the Committee on the Abuses of Medical Charities to the State Board of Charities of New York.

[3] Proceedings of Norfolk District Medical Society of Massachusetts, 1877.

[4] Reports of Investigating Committees.

the limited time that can be allowed for diagnosis and treatment. But it is because of the lowering effect upon the self-respect and independence of our people that this indiscriminate medical relief is chiefly to be deplored. In London the medical profession have been taking the subject into very thorough consideration for the last nine years, and through a system of Provident Dispensaries, as well as through investigation by the visitors of the Charity Organization Society, they are doing much to restrain the evil.

The subject has been for the last few years under active discussion in New York,[1] Boston, Philadelphia, and our Western cities.

While Provident Dispensaries are under favorable consideration it is realized that the first step towards remedy must be a complete system of investigation.

In this city the PHILADELPHIA SOCIETY FOR ORGANIZING CHARITY AND SUPPRESSING MENDICANCY affords, through its Ward Association, the means of investigation that would appear requisite.

To facilitate this end, the following dispositions are recommended:—

1st. That the seven GENERAL DISPENSARIES of Philadelphia, to wit: The Southern, The Philadelphia, The Northern, The Philadelphia Society for the Employment and Instruction of the Poor, The Howard Hospital and Infirmary for Incurables, the Charity Hospital, and the Church Dispensary of Southwark, divide the city of Philadelphia east of the Schuylkill River into districts, composed of groups of wards, and that their services be confined to applicants residing within their several districts, as far as their charters will permit.[2]

A convenient division it is found could be made of the city in accommodation with the limits already practically adopted by these dispensaries.

[1] It is stated in the last report (for the year 1878) of the New York Dispensary, that a charging system of ten cents per visit as part payment for medicines has been introduced, and with very satisfactory effects. Only six per cent. were found unable to pay the fee, and were placed on the free list. These payments added between $3000 and $4000 to the revenue of the dispensary for the year. The report also states that the system of charges is in operation with the other general dispensaries with possibly one exception.

[2] The seven General Dispensaries of New York have divided the city between them, each confining relief to its own district.

This Territorial Distribution would secure—

1st. Convenience in co-operation with the Ward Association.

2d. A due apportionment of their services.

3d. An avoidance of overlapping in the registration and treatment of Beneficiaries, and the checking of the so-called Rounders on Medical Charities.

It is considered very desirable, and is strongly recommended that the services of the Visiting Physicians at the houses where patients are unable to attend the office of the Dispensary should be so extended as to cover the whole city. Visiting Physicians are now provided by the Philadelphia Northern Dispensaries, and the great value and importance of this provision as a true and needed charity is respectfully urged upon the attention of the management of the Southern, of the Phila. Society for the Employment and Instruction of the Poor, of the Howard, of the Charity Hospital and of the Church Dispensary of Southwark, inviting the addition of these services to the relief already afforded by these institutions. The service, attempted by the Physicians of the Guardians of the Poor, is found to be insufficient in force to cover adequately their districts. It is not deemed *practicable* or *desirable* to confine the Out-door (Dispensary) relief of *Hospitals* or of any of the *Special Dispensaries* to given *Districts.* The foregoing propositions relate to territorial distribution, and are therefore necessarily restricted to the *General Dispensaries.*

All the Medical Charities, whether general or special, are urged to co-operate in having investigation made of applicants for Out-door (Dispensary) relief, where discrimination may be required, as proposed through the Ward Associations of the PHILA. SOCIETY FOR ORGANIZING CHARITY AND SUPPRESSING MENDICANCY. A charge of ten cents per visit, or for medicine, may be made, unless specially exempted after investigation, and provided their charters do not prevent. Out-door patients, however, who may offer and shall be required as subjects for clinical instruction should be admitted for treatment without investigation or payment of fee. Applicants for admission to the Hospital Wards may be referred for investigation at the discretion of the admitting officers.

It is suggested that the conditions for medical relief differ from other forms of relief—

1st. In that physical suffering cannot be passed by; and

2d. In that the relief, not being exchangeable, is not liable to abuse.

The question of investigation, therefore, should be as to the ability to pay, and not upon the moral standing of the patient, as the general rule.

The payment of a small fee would tend to preserve the self-respect of the applicant and, at the same time, aid in the support of the services, and would, in a measure, check an undue recourse to the Medical Charities.

The very salutary effects that have resulted from this system of fees in New York would commend strongly its adoption by all the Medical Charities of Philadelphia, unless prohibited specifically by the terms of their charters.

It is believed that these provisions are sufficiently simple to be put in immediate operation without difficulty, and that the general ability to pay the fee, as evinced in New York, will give comparatively few cases for investigation. It will be observed that the investigation will only be required (1) when the applicant is believed to be above the class for medical charity, and that the reference to the Society for investigation will be exercised at the discretion of the medical staff; and (2) where the beneficiary pleads an inability to pay the fee. It is believed, from experience in New York and elsewhere, that over 90 per per cent. are able to make this small contribution to the funds of the institution, and that, if the practice is generally adopted, in a very short time the requirements will become understood by the patients, and but few cases will ask for the exemption. These cases would in most instances, it is presumed, apply to the Ward Offices for the Certificate of the Superintendent before appearing at the Medical Charity. If not, the medical officers, unless in cases of special distress or urgency, will refer the applicant to the Ward Office for the Certificate, *before* treatment. When ignorance of the Ward Office is claimed, the applicant should be referred to the Office of the Ward Association in which the Medical Charity is situated, for the needed information.

Diagrams showing the location of the several Ward Offices would also be furnished to each Medical Charity from the Office of the Society for Organizing Charity.

REPORT

ON

AMERICAN MEDICAL NECROLOGY.

REPORT ON AMERICAN MEDICAL NECROLOGY.

By J. M. TONER, M.D.,
CHAIRMAN OF COMMITTEE.

A BRIEF HISTORY OF THE ORIGIN OF THE STANDING COMMITTEE ON NECROLOGY.

BELIEVING that a brief sketch of the origin and development of the Committee on Necrology of the American Medical Association, drawn from the published Transactions, would possess some interest, and possibly furnish information of use in any future legislation upon its duties, the following facts have been collated.

The first suggestion relative to collecting and publishing memoirs of our leading medical men was made at the meeting of the Association in 1848, in the city of Baltimore, on which occasion Prof. J. R. W. Dunbar, of that city, read a letter from Dr. Stephen W. Williams, of Deerfield, Mass., advocating the propriety of taking measures for preserving a record of the lives of the eminent physicians of the United States, and submitted the following resolution:—

"*Resolved*, That the constitution be so amended as that a permanent committee be appointed on Medical History and Biography."

This resolution was laid over for future consideration May 4 (vol. i. p. 45). At the meeting in Boston, Mass., in 1849, "The proposed amendment to the constitution, introduced at the last annual meeting by Dr. Dunbar, which provides for the appointment of a standing committee on 'American Medical Biography' was considered, but laid on the table" (vol. ii. p. 46). Dr. L. A. Dugas at the same meeting, however, proposed amendments to the constitution, providing for fourteen standing committees, among which was one on "American Medical Biography." (Laid over under the rule; vol. ii. p. 42.)

At the meeting in Cincinnati in May, 1850, these proposed

amendments came up, but all resolutions contemplating alterations of the constitution were, by the following resolution, on the motion of Dr. Roberts, laid upon the table:—

"*Resolved*, That all proposed alterations of the constitution be and they are hereby laid on the table for the present."

This of course carried with it the proposition for a committee on American Necrology (vol. iii. p. 46).

Confidently expecting the authorization of such a committee, Dr. S. W. Williams had prepared a report, and forwarded it to the meeting at Cincinnati in 1850, which was presented to the society by the secretary, and it was ordered to be printed. (See vol. iii. p. 47.) This paper contains sketches of forty-six physicians and makes forty eight pages in the volume, and is entitled "A Brief Notice of some of the Physicians of the United States who have died within a few years."

Such is a connected record of the proceedings which gave rise to the first necrological report made to this Society.

The question of appointing a committee on necrology after this seems to have rested until 1853, when a resolution was again offered by Dr. S. W. Williams, in the following words:—

"As we are constantly called upon to deplore the ravages of death among the illustrious and worthy members of our profession throughout the United States: *Resolved*, That a standing committee be appointed by the Association to procure memorials of the eminent and worthy dead among the distinguished physicians of our country, and present them to this Association for publication in the Transactions."

Dr. C. C. Cox, of Maryland, moved an amendment not confining the memoirs to distinguished members of the Association.

On motion of Dr. James E. Morgan, of Washington, D. C., the resolution and amendments were laid on the table (vol. vi. p. 38).

The railroad disaster at Norwalk, Conn., on Friday, May 6, 1853, by which the lives of forty-four passengers were lost, among whom were seven physicians, members of the American Medical Association, returning to their homes from the meeting in New York, wrought a change in the views of the members on the subject of collecting memorials of deceased physicians. This will be seen by reading the report of the action of the committee appointed by the meeting held by the members still remaining in New York on the day after the accident (vol. vii. p. 19).

But still more conclusively is it shown by the action of the Association when Dr. J. B. Johnson, of Missouri, read a letter from Dr. Stephen W. Williams, of Laona, Winnebago County, Ill. (to which place he had removed from Deerfield, Mass., in 1852, and where he died July 8, 1855), again calling the attention of the Association to a certain preamble and resolution offered by him at the first meeting through Dr. F. Campbell Stewart, of New York, but read by Dr. Dunbar, and laid on the table. He begged the society to call up the subject through his friend Dr. Johnson, of St. Louis. On motion of Dr. Johnson the resolution was taken up and adopted, as follows:—

"*Resolved*, That a standing committee be appointed by the Association to procure memorials of the eminent and worthy dead among the distinguished physicians of our country, and present them to the Association for publication in the Transactions" (vol. vii. p. 30).

The account of the railroad disaster at Norwalk, Conn., with biographical sketches of the seven members who lost their lives in that accident, is given in vol. vii. p. 601.

Although the resolution providing for a committee passed in 1854, no committee seems to have been appointed until the meeting of the following year, in Philadelphia, at which Drs. P. A. Jewett, of Connecticut, Thomas F. Betton, of Pennsylvania, C. J. Blackburn, of Kentucky, William M. Boling, of Alabama, and Zina Pitcher, of Michigan, were appointed a committee to procure memorials of the eminent and worthy dead (vol. viii. p. 42). At the meeting held in Detroit in 1856, the committee, with Dr. Jewell as chairman, was continued, and requested to make a report of such sketches as they had been able to collect. No report, however, appears in the Transactions of that year.

In 1858 Dr. C. C. Cox was appointed to report on American Medical Necrology (vol. xi. p. 39). He was reappointed on this committee at the meeting at Louisville in 1859, though he made no report (vol. xii. p. 33). The doctor, however, at the meeting in New Haven in 1860, made a report on American Medical Necrology, which was ordered to be printed (vol. xiii. pp. 30–38), and may be found in full at page 787, and the committee was continued. The war coming on, the meetings of 1861 and 1862 were not held.

At the meeting in Chicago in 1863, Dr. Cox read his second report on Necrology (vol. xiv. p. 22; report printed, p. 171; com-

mittee continued, p. 37). The following year (1864), in New York, Dr. Cox announced that his report was nearly completed, and asked for the privilege of referring it when finished to the Committee on Printing. He also offered a resolution that the Committee on Necrology be enlarged, so as to have a member on it from each State, which was agreed to (vol. xv. p. 30).

In 1865, upon the motion of Dr. Couper, of Delaware, it was made the duty of the Committee on Necrology to revise the list of members, and mark properly those from the several States who are deceased (see vol. xvi. p. 56).

Since that time the Committee on Necrology has reported nearly every year, and the only change of note in its constitution or duties is the limiting the admission of biographies to its own members (see vol. xxix. p. 53).

Introduction to Report of 1880.

In presenting the report of the Committee on Necrology, I cannot refrain from acknowledging the very valuable assistance I have received from my associates representing the several States; and it affords me special pleasure to state that the work assigned to this Committee is now much better defined and more systematic than it has been in the past. Although a resolution making it the duty of the Committee on Necrology to revise the list of members, and properly mark those who are deceased, was passed in 1865, yet this task has been almost entirely neglected. From a correspondence with my associates I learn that but few of them have access to complete files of the Transactions, and they, in fact, do not know with certainty the physicians of their respective States who are or were members, and entitled, if deceased, to notices in the Necrological Report, a circumstance of evident difficulty and calling for correction. The resolution defining who has a right to be noticed includes all who have at any time been enrolled as members of the Association, if they maintained through life a good standing with the profession, though their fellowship with us had ceased. It has been found that for the purposes of the Committee the triennial list of members, which omits the names of all who fail to pay their dues, in accordance with the regulations, was of but little use. To be able to furnish the necessary information as to the entire membership from each State, I made a complete study of the registry of members

from the first meeting in New York, in 1846, directly from the minutes as published in each annual volume (and not from the compiled list, with post-office address, which is intended to serve as a directory). This study reveals the fact that the early Secretaries omitted to enter quite a number of names in the lists of members of the different States, although they appeared regularly enough in the minutes, and occasionally a name appears in the list of members not found in the minutes. The list I have prepared, is on cards and by States, and shows at a glance every, and the particular year that a member from any State attended. It includes, but with marks to identify them, the names of those elected permanent members, as well as those elected members by invitation. (See Appendix at end of volume.) At an early period in the history of the Society it was not unusual for professors in colleges to represent at the same meeting, one or more Medical Colleges or Institutions, situated in different States, and which in some instances were not located in the State where they themselves actually resided. In such instances I give the representation to the State in which the institution represented was situated, because the Association itself gave a place to such delegates on committees composed of members from each State without objection. In cases where a member moves from one State to another, and again attends the Association, either as a permanent member or as a delegate, he is credited to the State where he actually resides, or registers from. In this way it is possible for the name of the same person to be registered as a member from two, three, or more States, but is not credited in the same year from more than one.

This is proper and just to the several States in the premises. In some of the States there are a few individuals who having obtained membership in the American Medical Association, afterwards have in their practice fallen into irregularities and quackery; these have, of course, been dropped from membership in their local societies, and in this body.

These, when known, are marked. I have made copies of the lists of members for each State and Territory, the army and navy, and submitted them for the information of my associates and for correction in the spelling of names, and to ascertain who are still living, when deceased, and in what year, and at the same time soliciting sketches of those not noticed in our

Transactions. I marked all which the records show to be deceased from each State, and also those whose demise has been noticed in any of the Necrological Reports. The desired facts and corrections have very generally been obtained.

As this revised list by States will be of permanent and special use to the members of the several States, as well as to the Society, I recommend that the registration of the present meeting be incorporated, and the whole be published in the Transactions for the present year. The want of a correct list of members by States has often been felt by the Society, and particularly in the nominating committees, where it has occasionally happened that medical gentlemen are named for positions who have ceased to be members, and in a few instances never have been connected with the Association. In 1864 and 1865, and again in 1871, a Vice-President, who had never attended a meeting, nor had he been elected a permanent member, was on these occasions chosen. Should there still be errors in the roll of membership as presented, the opportunity will thus be given to the States to correct them by the year 1881, when the consolidated triennial list or directory of members will be published.

All of which is respectfully submitted.

J. M. TONER, M.D.,
Chairman of Committee.

ARMSTEAD, WILLIAM HENRY, M.D., was born in Randolph County, North Carolina, August 5, 1820; died of paralysis at his residence at Vaiden, Miss., Nov. 30, 1878. He was the son of John and Julia E. (Gaines) Armstead, of North Carolina.

At the age of fifteen his parents removed to Alabama, and, receiving a good preparatory education, he studied medicine, and graduated M.D. at the University of Louisville, Ky., in the spring of 1848. Shortly after this he began practice in Choctaw County, Miss., where he gradually acquired a good business.

He was united in marriage to Miss Mary E. Wilson. After a few years' residence in his first location, he removed to Vaiden, where he resided for the remainder of his days, engaged in a large, laborious, and responsible practice. His popularity led to his being sent frequently to the legislature as Representative from Choctow and Carroll Counties. He was a member of the Carroll County Medical Society, the Mississippi State Medical Society, and the American Medical Association, having been

sent as Delegate from the State Medical Society to the meeting in Louisville, Ky., in 1875. In the latter years of his life he suffered much from rheumatism, which greatly impaired his health. Throughout life he was highly respected, both as a citizen and as a physician. His wife and several children survive him.

A sketch of his life appeared in the Necrological Report of the Mississippi State Medical Society for 1879, from which this is taken.

JOHN BROWNRIGG, M.D.

AWL, WILLIAM MACLAY, M.D., was born May 24, 1799, at Harrisburg, Pa.; died at his residence, Columbus, Ohio, Nov. 19, 1876. His parents were both of English descent, and natives of Pennsylvania. He received his preliminary education in the college at Northumberland, Pa., under Rev. Isaac Grier. He commenced the study of medicine in 1817 at Harrisburg, under Dr. Samuel Agnew.

He attended lectures in the medical department of the University of Pennsylvania, under Professors Chapman, Physick, Cox, Hare, Gibson, and James, in 1819-20. He never graduated in medicine in regular course, but in 1834 he received the honorary degree of doctor of medicine from Jefferson Medical College.

Dr. Awl came to Ohio on foot in 1826, and settled in Lancaster, Fairfield County. He soon removed to a town in the same county, to which, from the nature of its site, he gave the name Lithopolis. In this location he quickly had opportunity to display his knowledge and skill as a surgeon. He was requested by Dr. Lucky to operate for the removal of a tumor, hard, irregular in form, and cartilaginous in structure, from the jaw and neck of a little girl, the child of a settler in the neighborhood.

As a preliminary step for safety, he tied the common carotid artery of the affected side—"the first time the carotid artery had been taken up west of the mountains, and the fourth time in the United States." The patient made a good recovery. This case was reported in the *Western Medical and Physical Journal* for October, 1827.

In 1828 or 1829 Dr. Awl moved again, this time to Somerset, and thence in 1833 to Columbus, where, in the same year, in connection with Dr. M. B. Wright, he combated the first epidemic of Asiatic cholera. His courage and skill are yet spoken

of with admiration by those who watched his conduct during that trying period.

In 1835 he, together with Dr. Daniel Drake and other prominent physicians, called a convention of all "the regular and scientific physicians of the State" to meet in convention in Columbus. They met on the 5th of January in the First Presbyterian Church, and, among other subjects, took into consideration the propriety of establishing proper institutions for the care of the insane and the education of the blind.

The convention memorialized the legislature, with the result of securing an appropriation for the erection of an asylum for the insane at Columbus, and Dr. Awl was appointed one of the trustees to build and manage the same. The building was completed in 1838, and Dr. Awl, resigning his position as trustee, was appointed superintendent of the asylum, which he conducted to the satisfaction of all concerned until 1850.

In 1837 he proposed the Ohio Asylum for the Education of the Blind, which was opened the same year in the basement of the First Presbyterian Church, with a very few pupils, but the State soon erected a proper building, and the institution is now second to none in the country.

Dr. Awl was one of the founders of the Association of Superintendents of Asylums for the Insane of the United States and Canada. He was the second president, serving the years from 1848 to 1851.

During one of the earliest meetings of this Association in Philadelphia he proposed the establishment of schools for idiots and feeble-minded persons, the first suggestion in regard to this subject in this country.

He was one of the original members of the American Medical Association, and at the first regular annual meeting at Baltimore, in 1848, was chosen one of its vice-presidents.

In 1837 he received the honorary degree of Doctor of Medicine from the Medical College of Ohio. He was an honorary member of the Ohio State Medical Society, an honor which has been, since the foundation of that society, but sparingly conferred. In 1861 he was appointed by Governor Dennison one of the Board of Medical Examiners for Surgeons of the Ohio regiments, and was made president of that board. In 1862 Governor David Tod appointed him superintendent of the State Capitol, which office he held six years. In 1873 Governor Allen

appointed him physician to the Asylum for the Blind, which office he held to the close of his life.

Dr. Awl was married on the 28th of January, 1830, to Miss Loughey, a lady of culture and admirable character, who, with their children, five in number, survives him.

Dr. Awl was a man of the greatest tenderness of feeling, mingled with firmness and force of character. He was during his life a consistent and earnest Christian, maintaining throughout cheerfulness and humor, with strict piety.

STARLING LOVING, M.D.

Bartlett, John Call, M.D., youngest son of George and Mary Gorham Bartlett, was born in Charlestown, Mass., October 5, 1808; died of paralysis, July 13, 1877. He prepared for college at Pembroke Academy, Pembroke, N. H., and graduated at Bowdoin College, in the class of 1828. He studied medicine with Dr. Thompson, of Charlestown, and received the degree of M.D. from Harvard University, in 1831, and for a long time followed his profession in Chelmsford. He was a physician of more than ordinary attainments, and during a long practice enjoyed the confidence and esteem of his patients, and also of his co-laborers in the profession. In 1834 he was married to Miss Maria J. Adams, only daughter of Hon. Joel Adams, who, with three sons, survives him.

In religious belief he was a Unitarian, and was always active in the interests of the denomination with which he was associated. He was for several years President of the North Middlesex Unitarian Conference. He was possessed of fine musical talents, and was at one time a composer of considerable prominence. He was also interested in agricultural pursuits, and was for some years a member of the Massachusetts State Board of Agriculture. In the educational institutions of the country he always took great interest, and was for many years a member of the School Committee of Chelmsford, and President of the Board of Trustees of Westford Academy. He was also for a long time one of the Trustees of the Lowell Five Cents Savings Bank, in Lowell.

His long and useful life was brought to a sudden close by paralysis, in Boston, at the age of sixty-nine years.

L. F. WARNER, M.D.

BEVAN, THOMAS, M.D., was born in Cincinnati, Ohio, on the 11th day of June, 1830; died at his residence in Chicago, March 15, 1880. After a thorough academic education, he entered upon the study of medicine, and graduated M.D. at the Ohio Medical College in 1851.

Intent upon the most thorough preparation for the practice of his profession, he went abroad, and for *two* years we find him an indefatigable student in the medical department of the University of France. In 1853 he returned to America, and during that year was married to Miss S. E. Ramsey, daughter of Col. George Ramsey, of Clermont County, Ohio. In 1854 he established himself in Chicago, and from that date till the hour of his death, he was intensely devoted to the duties of his profession, and early identified himself with this Society. He was appointed one of the attending staff in Cook County Hospital in 1865, and for fourteen years was a faithful attendant in that *humane institution.* He was only relieved from duty at his earnest solicitation, on account of impaired health. For five years, dating from 1867, he filled the chair of Hygiene in the Chicago Medical College, retiring from this position on account of continued indisposition. Dr. Bevan has written a number of valuable monographs, which have appeared in various medical journals, notable among which were his Reports upon *Cholera* in 1866 and 1873. A series of articles from his pen upon Sanitary Science, *also* appeared from time to time, which, had his life been spared, would probably have appeared in permanent form. He was a member of the American Medical Association, and of the Illinois State Medical Society. He was one of the founders of the Medical Press and Library Association of Chicago, and also of the Chicago Medico-Historical Society, and President of the Chicago Society of Physicians and Surgeons, as well as President of the Chicago Medical Society. During the war he served as Post-Surgeon at Camp Douglas. In every position his duties were conscientiously and faithfully performed. In his chosen profession for 25 years he worked with increasing reputation and untiring industry, and he rests from those labors with his work well done. That brain which had ministered so wisely and so well, had once and again given premonition of impending failure; but, *once* and again (though a severe sufferer) he had rallied from his sicknesses and resumed the duties of his profession. He spared not himself, but gave

his struggling energies to the fulfilment of his noble work. But the fatal issue came at an hour when we knew it not—the struggle was but for a moment—and our loved brother was at rest.

From Memorial Committee of Chicago Medical Society.

DR. J. H. HOLLISTER,
DR. DE LASKIE MILLER,
DR. EPHRAIM INGALS,
Memorial Committee of Chicago Medical Society.

BIDDLE, PROFESSOR JOHN BARCLAY, M.D., Dean of Jefferson Medical College and President of the Association of American Medical Colleges, died in Philadelphia on the 19th of January, 1879. He had been suffering from a typhoid condition, complicating an attack of pleurisy, for about a fortnight, but was not considered as dangerously ill until the day before he died. The announcement of his death was a shock to the profession, and a severe loss to the community, by whom he was universally respected and esteemed. He occupied a prominent position in social circles, and held some important trusts. He was president of the directors of the County Prison, attending physician to the Girard College and to the Institution for the Deaf and Dumb, and consulting physician to a number of local charitable institutions.

Professor Biddle was born in Philadelphia in 1815, and was educated at the University of Pennsylvania, from which he received his diploma in March, 1836. After spending several years in Paris, he returned to his native city, and at once took an active interest and a prominent position in professional matters. His *clientèle* was select but never extensive, as he preferred a consulting to a private practice. He was Professor of Materia Medica in the Franklin Medical College, and afterwards in the Pennsylvania Medical College, both of Philadelphia. Upon the death of Dr. T. D. Mitchell, Professor of Materia Medica and Therapeutics at Jefferson Medical College, Dr. Biddle was elected, in the fall of 1865, to the position, which he occupied up to the time of his demise. Dr. Biddle was one of the editors of *The Medical Examiner*, a bi-weekly, afterwards a monthly journal, published in Philadelphia from the year 1838 to 1844, then merged into the *North American Medico-Chirurgical Review.* He had not, of late years, been a frequent contributor to medical

literature. His work on Therapeutics and Materia Medica, designed as a class-book for students, was well received by the profession, and has now reached its eighth edition.

FRANK WOODBURY, M.D.

Boerstler, George W., M.B. This revered and eminently useful man was born in Funkstown, Md., A. D. 1792, and died at his residence in Lancaster, Ohio, Oct. 10, 1871. He received a good education, and when sufficiently advanced, he yielded to paternal persuasion and commenced to study for the ministry, in the Lutheran Church. The mind of young Boerstler, however, had been fixed in another pursuit for life; it was the illustrious profession of his father—the science and practice of medicine. The more this occupied his thoughts, the more it won the approval of his judgment, and propitiated the desires of his heart. At last—all obstacles being removed—he entered in earnest upon the study of medicine, and graduated Bachelor of Medicine at the University of Maryland, in Baltimore, in the year 1820, when he received from Prof. Potter the following commendatory certificate, which, coming from such a broadly known and eminent source, was to young Dr. Boerstler a credential letter, introducing him, in flattering terms, to the confidence of the medical faculty anywhere in the United States, or in Europe:—

"The bearer hereof, Dr. George W. Boerstler, has been duly examined by the Professors of the University of Maryland, and acquitted himself to their entire satisfaction, in every department. No man ever left the faculty of physic with more éclat. He carries with him as much knowledge as has ever fallen to the lot of any one man since the establishment of the institution. His capacity is not excelled by any man, and his industry is equal to his capacity. His sterling integrity and moral worth will always recommend him to the consideration and patronage of the wise and virtuous, as soon as he becomes acquainted with them.—Nathan Potter, M. D., Prof. Theory and Practice of Medicine, University of Maryland, March 4th, 1820."

Dr. Boerstler was married to Elizabeth Sinks, and removed from Hagerstown, Md., to Lancaster, Ohio, in 1833. He was accompanied by his wife, daughter, and son-in-law, Dr. Tom O'Edwards, who was associated with him for years in the duties of his profession. The deeply lamented Robert McNut, M.D.,

had died shortly before their advent, leaving a wide field of practice unoccupied, which they rapidly gained possession of, and made their own. Mrs. Boerstler died in 1838. The doctor married his second wife, Elizabeth Schur, who still survives him.

The medical reputation of Dr. Boerstler was built upon a foundation of solidity, and this grew up into vigor and public appreciation more and more with his advancing years. He was a medical student to the end of his life; kept uniform step with the onward progress of his profession; was familiar with all its signalized specialties; was well posted in its leading scientific expositions; was cognizant of every public valuable curative discovery, and was therefore fully prepared for every existing emergency in his own immediate practice. His diagnosis of disease, in its subtle and more complicated forms, was always received by his professional brethren with confiding and commanding respect. As an experienced and learned consulting physician, he acquired a wide reputation. To accomplish the greatest good in the practice of his profession, was the passion of his life. No one ever sought his aid in vain, rich or poor, misery in rags, or disease in tapestry; he went to all, to comfort all, and, if practicable, to relieve all. In whatever household he was summoned as a physician, he left it as a dear and confidential friend. In his intercourse with his medical brethren, he was governed ever by the strictest formulas of honor; no man understood more sensitively than himself the delicate obligations of his professional code of ethics, and no one was more courteous and punctilious in observing them.

Dr. Boerstler was a man of too noble a nature to be sordid; he was too generous in his disbursements to be rich. On the day preceding his death, he appeared, to those who saw him, in his customary health; during the evening of that day he had a long and very pleasant intercourse with a friend from abroad, who communicated to him some gratifying intelligence respecting an absent member of his famtly, long loved, and very dear to him. With a father's full heart, he immediately prepared a long, consoling, paternal letter which he intended to have copied early the next day, and despatched as early as possible to this distant one. The ensuing morning found him up, happy with hope, and glowing with good intention; loving and loved, at peace with God, and in charity with man. While standing

before his glass to adjust some personal toilet requirement, the supernal mandate came to call him home; he sank suddenly into the arms of his wife and daughter, and, unruffled and painless, he passed gently and rapidly away.

Dr. Boerstler was a member of the Fairfield County Medical Society, and the Ohio State Medical Society, and in 1850 became a member of the American Medical Association.

STARLING LOVING, M.D.

Bohannan, Richard Lafon, M.D., was born in Essex County, Va., in 1789; died from disease of the heart at his residence in the city of Richmond, Va., July 15, 1855.

He was the son of Col. Joseph Bohannan, a successful planter in Essex County. His mother was Elizabeth, daughter of Col. Lafon, a French Huguenot, who settled in Virginia, and fought bravely in the war for American Independence. The subject of this sketch received a good academical education at what was known as Rumford Academy, in King William County. On leaving the institution he engaged for some time in teaching. Selecting medicine as a profession, he became a pupil of his relative, resident in Essex County, Dr. William Baynham, one of the most learned and skilful physicians at that period in America. After a thorough preparation under this tutor he went to the University of Pennsylvania, where he graduated M.D. in 1811. He was a member of, and attended the Medical Lyceum of Philadelphia, and received from it a diploma or certificate of membership, dated March 3, 1810, signed by Joseph Klapp, M.D., and John Syng Dorsey, M.D.

Returning to Virginia he took up his residence in Richmond, and opened an office for the practice of his profession. He left college, as did most graduates of the University, with a great admiration for Dr. Rush. Communicating to the Professor his intention to locate in Richmond, he received from him the following letter, which is possessed by Dr. Bohannan's descendants:—

"Philadelphia, October 18, 1811.

Dear Sir:—I am not sufficiently acquainted with any person in Richmond to serve you by letters of recommendation. You are at liberty, however, to show the following general testimony in favor of your character, to all such persons as can be useful to you.

Dr. R. L. Bohannan, after studying the time prescribed by the laws of the University of Pennsylvania, graduated with honor to himself, and much to the satisfaction of all his teachers. His talents and knowledge may for a while be obscured from the notice of his patients, by his uncommon modesty; but, the

more and the longer he is known, the more he will be valued as a physician, and esteemed as a man. He earned with honor the respect of all his teachers, and particularly of the subscriber, Benjamin Rush, M.D., Professor of Medicine in the University of Pennsylvania. I am much gratified by the account you have given me of the principles taught in our University, beginning to prevail in your State, and particularly of their adoption by Dr Baynham, than whom there are probabty few better judges of truth and utility in medicine, in the United States. Accept my thanks for your friendly wishes for my health and happiness, and be assured of a continuance of the great regard of, dear sir,

Yours sincerely,

BENJAMIN RUSH.

To Dr. R. L. Bohannan."

Shortly after Dr. Bohannan began practice there was a severe epidemic of "sore throat," or perhaps what is now recognized as diphtheria, which caused many deaths in different parts of the State. The doctor's parents were both attacked, and after a brief illness died of it, before their son, the doctor, could reach them. This was a great shock to the doctor, and, if possible, increased his sympathies for the sick and suffering, and made him the more anxious to understand the mysteries of disease and to discover the art of cure. His success in treating this epidemic did much to bring him speedily and favorably before the public, and laid the foundation of the popularity and responsible professional relations he sustained with increasing reputation for forty years.

When, in 1837, the measure to establish a Medical College in Richmond was projected, Dr. Bohannan was looked upon as the head and front of the enterprise. He was ably supported by Drs. Cullen, Warner, Chamberlain, Maupin, and Johnson, and it was opened to the public, under the auspices of Hampden Sidney College, in 1838. He was elected to the chair of Obstetrics and Diseases of Women and Children, a position which he filled with ability to the time of his death. In 1838 Dr. Bohannan was united in marriage to Sarah Cabell, only daughter of George Whitlock, Esq., of Chesterfield County, Va., whose mother was a Miss Bacon, a descendant of the celebrated Lord Bacon. George Whitlock married for his third wife Pauline, daughter of Col. Samuel Jorden Cabell, of Nelson County, Va., of Revolutionary fame. The doctor left a widow and seven children, five sons, and two daughters. Two of his sons fell in the Confederate States' service. One of his daughters is married to Charles, son of Col. Edward Lorraine, late chief engineer of the James River and Kanawha Canal.

The doctor was a laborious and studious man, solicitous for

and devoted to his patients, ever on the lookout for new and improved methods of diagnosis and treatment of disease. He had always enjoyed a fair degree of health to within a few months of his death. In his last sickness he was devotedly attended by his brother practitioners, but without avail. He was himself from the first conscious of the real trouble and its irremediable character. His demise was chronicled by the public press of the city, with a deep sense of the loss to the community of a physician of his ability. The funeral cortege which followed his remains to "Hollywood Cemetery" was unusually large and sympathetic, for they had nearly all been his patients and were his friends.

A plain marble slab, with a simple inscription of his name and age, marks the resting-place of his mortal remains. Had he been a good collector, the labors he performed should have put him in possession of a handsome fortune. But his generosity and charity prevented this. The doctor was for many years connected with the Episcopal Church, and for some years served as a vestryman.

Dr. Bohannan was a member of the Virginia Medical Society, and also of the American Medical Association.

I am not informed of any contributions he may have made to professional literature.

Data from Dr. L. S. Joynes.

J. M. T.

BOHRER, BENJAMIN SCHENKMEYER, M.D., was born in Georgetown, D. C., of respectable parentage, April 6th, 1788; died of paralysis, at his residence in Georgetown, August 19th, 1862. Having finished his preliminary education at a private academy, he began the study of medicine in the office of Dr. Charles Worthington, then a very prominent practitioner of the District. He received his diploma from the University of Pennsylvania in 1810. His thesis was on "The Hemorrhagic State of Fever." He practised for some time in Georgetown. In 1822, he moved to Cincinnati, Ohio, where he had been appointed to fill the chair of Prof. of Materia Medica in Ohio Medical College, which he did for several sessions; after which he returned to the field of his first labors. Here he acquired an honorable and lucrative professional business. Dr. Bohrer was a fine classical scholar, and an eminent student in general literature, as well as medicine.

He corresponded with the prominent physicians of the day, and contributed articles to the medical journals. The doctor was tall, slender, and of pleasant address. He married twice, first Miss Eliza, daughter of Nathan and Jane Luffborough. This union resulted in a large family of sons and daughters. The second, Mrs. Maria Forrest, *née* Taylor, from which there was no issue.

The subject of this sketch possessed a large and valuable library, which, when sold, attracted buyers from all parts of the country. Dr. Bohrer was one of the chartered members of the Medical Society of the District of Columbia, and was always a warm supporter of the organization. He was also a member of the Medical Association of the District of Columbia. In 1851, he was a delegate from the Medical Society of the District of Columbia to the American Medical Association. The doctor was one of the early visitors appointed by the President of the United States to inspect the United States Hospital for the Insane, situated in the District of Columbia. Marked respect was paid to his memory by the profession and the citizens generally, who attended his funeral in great numbers. He was buried in Oak Hill Cemetery, Georgetown, D. C.

GRAFTON TYLER, M.D.

BOLTON, JAMES, M.D., was born in the city of Savannah, Ga., June 5th, 1812; died at his residence in the city of Richmond, Va., May 15th, 1869. His father was John Bolton, a successful merchant and member of the well-known firm of Robert & John Bolton. His mother was a daughter of a descendant of a family of one of the original settlers of Georgia. The subject of this sketch passed his childhood in the city of Savannah; but while yet a boy, his parents removed to the city of New York.

In that city he received his education, graduating A. B. from Columbia College in 1831. He enjoyed the advantage, while studying the classics, of having as his tutor the renowned Professor Anthon. After obtaining his literary degree, he began the study of medicine, and graduated M.D. in 1836, at the College of Physicians and Surgeons of New York. He spent some time in the office of Dr. John Kearney Rogers, with a view to perfect himself in the treatment of the diseases of the eye and ear. He also served as clinical assistant for some time to America's most eminent surgeon, Valentine Mott, then in the prime of life, and

at the height of his brilliant career as an operator, and was thus assistant in some of the greatest operations known to surgery. Thus prepared for practice, Dr. Bolton selected the city of Richmond as the field of his professional labors. His fine acquirements, literary and professional, together with his correct and gentlemanly deportment, soon led to a good general practice. He was in the enjoyment of a full and lucrative business when the war between the States broke out. His convictions of the right in this struggle were with his section. He therefore entered the military service of the Confederate States as a surgeon, and served with different commands, and at various posts, during the war. He was surgeon-in-charge at "Howard's Grove," the receiving hospital for the wounded brought from the seven days' fight around Richmond, "Gainesville," "Seven Pines," "Mechanicsville," etc. Relieved from this post, he was assigned to the duty of caring for the wounded officers who were domiciled in private houses for treatment within the city.

Dr. Bolton also had charge, for a time, of Bellevue Hospital, within the city limits. He was afterwards on duty at the field hospital of Chancellorsville and the Wilderness, where he gave attention to Federal and Confederate wounded, who came under his care, with the same promptness and efficiency. Gen. James Wadsworth, of the Fifth Army Corps, who was mortally wounded in the battle of the Wilderness, died under his charge. At the close of the war, the doctor returned to Richmond, and resumed practice, which he pursued with his usual energy and success, until attacked by Bright's disease, in the spring of 1869. The attack was unexpected, acute, and unmanageable; and, as usual in such cases, terminated fatally.

Dr. Bolton had stood at the very head of the profession in Virginia for years. He was as extensively and favorably known to the profession and the people of the State, if not throughout the South, as any physician in Virginia. He was a member of the Virginia State Medical Society, and its President in 1858. He was also a member of the American Medical Association, and served on a number of important committees

He was for many years an active member and an efficient worker in the Medico-Chirurgical Society of Richmond. He frequently contributed papers, and was always ready to elucidate points in diagnosis, pathology, and treatment.

In 1853, he was appointed, by the American Medical Associa-

tion, chairman of a committee to report at the next meeting on the administration of anæsthetics in parturition. I do not, however, find any record of his having made a report, in compliance with this appointment. In 1854, he was one of the editors of the *Stethoscope*, published at Richmond, Va.

Dr. Bolton published a treatise on "Strabismus," with a description of new instruments designed to improve the operation for its cure, in simplicity, ease, and safety, illustrated by cases. 8vo. 36 pp., Richmond, 1842. He wrote many articles, which were published in the current medical journals, among which were "On the Use of the Speculum," reports of autopsies and of interesting cases.

He was a ready and perspicuous writer; but I have not the means of furnishing a list of his contributions.

He delivered an address on "The Unity of the Races" before the Richmond Academy of Medicine, in 1867, in which he maintained the Biblical theory of one pair. It was an able presentation of this view, and attracted much attention at the time.

Dr. Bolton was united in marriage October 3d, 1838, to Miss Harrison, of Richmond, Va., by whom he had seven children, five sons and two daughters. His wife survives him, and one of his sons has entered the profession, and is now practising in Richmond. The Academy of Richmond held a special meeting on the occasion of Dr. Bolton's death, and passed appreciative resolutions relative to the doctor's life and labors in the profession.

Data from Dr. Bolton's medical journals, etc.

J. M. T.

Bruce, R. I., M.D., of Thomasville, Geo., was born in North Carolina September 17, 1817; drowned in a ravine, within the corporation limits, during a severe storm and heavy rainfall on the night of the 22d of May, 1880.

He received in youth a good common school education, and then took up the study of medicine. He attended lectures at the Transylvania University at a period when Dr. Dudley and his bright galaxy of able co-professors had advanced that institution to the zenith of its fame. The doctor began to practise in Stewart County, Geo., where he remained a year, and then came to Thomasville.

Here he acquired a fair business, and at the end of six years

he took a trip to Europe, and spent some time in the hospitals of Paris. Returning to Georgia, he located at Marsfield in Louisiana; but after a few years he returned to Thomasville, where he continued in active practice to the day of his untimely death. In July, 1852, Dr. Bruce was united in marriage to Miss Mitchel, of Thomas County, by whom he had one daughter and two sons, who survive him. One of his sons, W. W. Bruce, has studied medicine, and is a promising practitioner in Thomasville.

The subject of this sketch was not only an experienced physician, but a skilful surgeon, performing most of the surgical operations in his section. He was a man of enterprise, taking an interest in every movement calculated to benefit the public. He was a consistent and exemplary member of the Baptist Church, a member of the Thomas County Medical Society, and joined the American Medical Association in 1879.

Data from Dr. T. S. Hopkins.

J. M. T.

Buckingham, Charles Edward, M.D., was born in Boston in 1821; died at his residence in the same city February 10, 1877. He graduated at Harvard College in 1840, and from the medical department in 1844.

In his earlier years he had a hard struggle with adverse circumstances and limited means, with no outside influence to help or push him forward, but as he advanced in years, his real merits becoming better known, he entered gradually but surely upon a full and remunerative practice, and it may safely be said, that but few physicians in this city have enjoyed to a greater degree the confidence and affections of a larger circle of patients.

His interest was always manifest in all questions relating to the public welfare, such as the organization of the Board of Health, protection against smallpox and other contagious diseases, and his contributions to these and kindred subjects in the medical and daily journals were frequent and valuable. In his earlier years he was active in the establishment of the Boylston Medical School in co-operation with Drs. Bacon, Walker, Kneeland, E. H. Clarke, Thayer, Dalton, and Williams. Later he was appointed one of the surgeons of the Boston City Hospital, Adjunct Professor of Theory and Practice in the Harvard Medical School, and subsequently became Professor of Obstetrics in

the same institution, where he proved himself an instructive teacher and an impressive lecturer, his large experience enabling him to illustrate his teachings in such a graphic way as to fix them in the minds of his hearers. He was also at the time of his death consulting physician to the City Hospital, and the Boston Lying-in Hospital, Fellow of the London Obstetrical Society, and of the American Gynæcological Society, and Corresponding Member of the Philadelphia Obstetrical Society. The last few years of his life were years of suffering from complicated cardiac troubles, which finally resulted fatally at the age of fifty-six.

Data from memorial by Dr. G. H. Lyman.

L. F. WARNER, M.D.

Butt, William Beale, M.D., of Washington, D. C., was born in Mechanicsville, Montgomery County, Md., July 19, 1827; died at his residence, Washington City, June 28, 1877. He was the son of Richard and grandson of Proverb Butt, of Maryland. His mother was Sarah Ann Richards, daughter of Samuel Richards, Sr., who resided in Port Tobacco, Md.

Dr. Butt's father removed to the city of Washington when the subject of this sketch was but an infant. He attended the public schools of the city while a youth, and when sufficiently advanced became a pupil of John McLeod's school, and afterwards entered the Rittenhouse Academy in Georgetown, D. C., under the direction of Dr. Nourse. His medical studies were pursued in the office of Dr. Thomas Miller, and he was for a year or so one of the resident students in the Washington Infirmary. He attended three courses of lectures at the National Medical College, from which he graduated M.D. in 1850.

Soon after obtaining his degree he opened an office in the northern part of the city of Washington, where he practised with success until within a short time before his death, which resulted from paralysis. The Medical Society of the District held a meeting, and passed appropriate resolutions of respect for his memory and of sympathy for his afflicted family. He was a member of the Medical Society of the District of Columbia, and of the Medical Association of the District of Columbia, and of the American Medical Association. The doctor was united in marriage May 8, 1862, to Margaret Elizabeth Allyn, daughter of Lucius May Allyn, formerly of Connecticut, but for many

years resident of the District of Columbia. His wife survives him, but no children. Dr. Butt's remains rest in Rock Creek Cemetery. His funeral was attended by the Eureka Chapter of Masons.

J. M. T.

CALDWELL, AUGUSTIN BYRNE, M.D., was a native of Princeton, Kentucky; died at San José, California, February 16, 1876, in the 57th year of his age. He graduated in medicine from the University of Pennsylvania in the spring of 1841; settled in the practice of his profession at Mechanicsville, Illinois. Thence, after two years, he removed to Independence, Missouri, and in 1849 crossed the plains to California. In 1853 he located at San José, where he gained distinction for sound judgment at the bedside, and the spirit of kindness and sympathy which actuated him, and controlled his relations with the sick.

F. W. HATCH, M.D.

CHENEY. WILLIAM FITCH, M.D., was born at Canandaigua, N. Y., December 30, 1831; died of general paresis October 5, 1879. He was one of the leading physicians in the central and northern portion of the Sacramento Valley. He received his degree in medicine at the University of New York in March, 1861. Soon after this he entered the army as a surgeon in the volunteer corps. In 1869 he came to California, and, after a short time, settled in the town of Chico, Butte County, where he rapidly acquired a large practice, gaining the confidence, not only of the community among whom his labors were performed, but of the members of the medical profession in that portion of the State. He assisted in organizing, and was made President of, the Northern District Medical Society, and in 1876 was elected to preside over the California Medical Society, serving for one year.

F. W. HATCH, M.D.

CHEW, SAMUEL, M.D., was born April 29, 1806, in Calvert County, Md.; died at his residence in Baltimore December 25, 1863. He was educated at Charlotte Hall, St. Mary's County, Md., and afterwards at the College of New Jersey at Princeton, where he received the degree of A.B. in 1825, and of A.M. in 1828. His medical studies were commenced in 1826 under the

guidance of Dr. William Donaldson, in Baltimore, and after attending three courses of lectures in the school of medicine in the University of Maryland, he received the degree of M.D. April 6, 1829, from the hands of Roger B. Taney, then Provost of the University. After practising his profession for five years in his native county he removed to Baltimore, and entered upon practice there in 1834.

In August, 1841, he was appointed to the chair of Materia Medica and Therapeutics in the University of Maryland, which he filled until 1852, when he was transferred to the chair of Principles and Practice of Medicine. He was the author of various addresses and contributions to medical journals, and of a volume of lectures on medical education. He continued in the constant exercise of his duties as a teacher and practitioner of medicine until his death.

JOHN MORRIS, M.D.

Christian, Marcellus P., M.D., was born in the county of Buckingham, now Appomattox, in the year 1832; died of pneumonia at his residence in the city of Lynchburg, Va., Nov. 2, 1879. The doctor received a good academical education, and then studied medicine.

After preparing himself to attend lectures profitably, he matriculated at the University of Virginia, and attended the course of 1854–55. The following year he went to the city of New York and attended lectures at the University of New York, and graduated M.D. at that institution in the spring of 1857. Returning to Lynchburg, he expected to open an office and make it his permanent home, but finding his health somewhat impaired he was advised to take a sea-voyage. This turned his attention to the United States Navy, and in the fall of 1857 he appeared before an examining board of surgeons in Philadelphia, and passed such a satisfactory examination that he was at once commissioned an assistant surgeon in the United States Navy. In 1858 he was ordered to duty on the U. S. frigate "Niagara," then about to sail for the coast of Africa, to return to that country a cargo of natives captured by the government from a slaver.

On his return from this cruise he was ordered to the sloop of war "Brooklyn," on a cruise to the West Indies and Gulf of

Mexico. After this he served on the steam frigate "Susquehanna" in the Mediterranean.

During the cruise in the Mediterranean he was transferred to the steam frigate "Richmond," on which he remained until the breaking out of the war, when the Mediterranean squadron was ordered to return to the United States. Arriving in New York, in May, 1861, he resigned his commission in the United States Navy, and tendered his services to the Confederate States government.

Before a navy was organized by the Confederate government he served as surgeon in Culpeper Court House Hospital.

In the fall of 1861 he was ordered to Island No. 11, Mississippi River, and then to the Confederate States gunboat "McRae," below New Orleans. After the fall of New Orleans he was stationed at Savannah, Charleston, and the last two years of the war was on duty at the Naval Hospital in Richmond. In 1862 he was united in marriage to Miss Nannie, daughter of Micajah Davis, of Liberty, Va. His wife died in 1873, leaving one child, a daughter. After the war Dr. Christian returned to Lynchburg and began to practise, and was soon fully employed, and to the time of his death stood in the front rank of his profession. "In the private walks of life Dr. Christian commanded the confidence and esteem of all who knew him. He was true to his friends as the magnet to the pole, and immovable in his adherence to right duties and principles. Though often blunt and seemingly impatient, his heart was ever warm, his nature kind, and his impulses generous. He will be sadly missed in the social circle, in the profession, and by his relations and friends, but most of all by that desolate home where dwells that young heart, made orphan and left bleeding under the deep shadow of a great and irreparable affliction."

From data furnished by Dr. M. N. Fleming through Dr. L. S. Joynes.

J. M. T.

Clapp, Sylvanus, A.M., M.D., was born in West Hampton, Mass., Nov. 22, 1815; he died at his residence in Pawtucket, R. I., June 15, 1879. He was the son of Bela Parsons and Cynthia (Carr) Clapp. His father, Bela P. Clapp, was a member of the legal profession. Dr. Sylvanus Clapp was the eighth in the

regular line of descent from Roger Clapp, who came to New England from old England in 1630. Roger Clapp was a captain in the service of the king, and was the commandant of the Governor's Castle. Dr. Clapp received the ordinary public school instruction of the times, and completed the higher education at Sheldon Academy in Southampton, Mass. He commenced the study of medicine with Dr. Benjamin Barrett, of Northampton, Mass., in 1834, attended lectures at the Harvard Medical School in 1835, and at the medical department of Dartmouth College in 1836, receiving the degree of M.D. from that institution the same year.

He first settled in Chesterfield, Mass., where he continued in the practice of his profession for five years, removing in 1841 to Pawtucket, R. I., where he had a large and varied practice during the remainder of his life, or until within a few months of his decease.

As a practitioner of medicine Dr. Clapp was eminently progressive, always prompt to adopt any apparently substantial improvement in the methods of the treatment of disease.

He also acquired a very considerable reputation in the practice of surgery. His experience in that line was quite extensive, and included many operations requiring high surgical attainments.

At all times he seemed to have full self-possession, was cool, cautious, guarded in diagnosis and prognosis, and at the same time prompt in the treatment of disease at the proper time, and in meeting surgical emergencies.

In personal appearance Dr. Clapp was not above medium height, was firmly and rather stoutly built, of florid complexion, with a face indicative of intelligence and decision, many times impassive and unreadable, but ready to light up at once with the fullest expression of benignity. In manner he was dignified and courteous, without the slightest approach to ostentation. He enjoyed almost uninterrupted good health, until within the last year of his life. His character as a man and a citizen was without reproach. Whatever presented the promise of advancing the moral and social interests of mankind, had his warm support, and he was himself the practical exemplar.

Dr. Clapp was not a voluminous writer; his communications were more frequently verbal than written. Some of his papers, read before the Rhode Island Medical Society, have been pub-

lished in its Transactions. He held various offices in the Rhode Island Medical Society, and was elected its president in 1864 and 1865. He was consulting surgeon to the Rhode Island Hospital from its formal opening, and was for one term visiting surgeon. He was also consulting physician to the Butler Hospital for the Insane, and president or manager of other public medical charities. He was a member also of the Providence Medical Association and of the American Medical Association. He received the honorary degree of Master of Arts from Brown University in 1870.

January 15, 1839, he married Lucy Marie, daughter of Ebenezer Clapp, a distant relative and descended from the same stock, by whom he had three children, viz., Jane Frances, Levi Wheaton, and Susan Adela.

Biographical sketches of Dr. Clapp have been published in the various newspapers of the State, in the History of the Towns of Rhode Island, in the New England Hand-Book, in the Transactions of the Rhode Island Society, and in the Physicians and Surgeons of the United States.

G. H. FISHER, M.D.

CLARKE, HENRY, M.D., was born in Marlborough, Mass., October 3, 1824; died at his home in Worcester, Mass., on the 17th of April, 1880, after an illness of one week, of pneumonia.

He was a son of Benjamin and Lucy Howe Clarke, and his ancestry on both sides were identified with the history of his native town. His father was a man of strong character, whom he always remembered with great respect, and the memory of his mother was always fresh and fragrant.

Dr. Clarke pursued his early studies at academies in Marlborough and Leicester, Mass. His wish to take a collegiate course was hindered by illness and impaired health. When able to resume study, he decided to begin at once a course with reference to his chosen profession, medicine. He removed to Worcester, and studied one year with the late Henry Sargent, M.D. In 1848 he entered the Harvard Medical School, where he took at once a high position in his class. The Boylston prize was awarded him for a thesis upon Gangrene of the Lungs. After having graduated M.D. in the spring of 1850, he sailed for Europe, and remained there a year and a half, pursuing medical studies in the hospitals of Paris and Vienna, and

also taking private courses of instruction. Having limited means, he denied himself in every way that he might prolong the period of study abroad. On his return, in the autumn of 1851, he established himself as a practitioner in Worcester.

In May, 1854, he married Rebecca Faulkner, youngest daughter of the late Hon. Alfred Dwight Foster, of Worcester. Mrs. Clarke and two daughters survive him. An only son, of great promise, died in 1866, at the age of eleven years, and his death left a deep and abiding sorrow in his father's heart.

Dr. Clarke was an enthusiast in his profession, and entirely devoted to all its duties. His success in it was early insured by the spirit with which he entered practice, and the skill he showed in both surgery and medicine. He endeavored in every way to keep up with all the improvements and discoveries that could be of use to him in his profession. He had paid special attention to the diseases of women and children from the outset, and in 1861 he went again to Europe, and spent four months in medical study in Paris and Edinburgh.

After the death of his son in 1866, his health required him to rest from the duties of his profession. At that time and afterwards, when in 1876 he went to Europe with his family, he sought not rest and pleasure alone, but to gain by study and observation all that he could, for use in his practice.

His health was never robust, but he was always ready, always untiring, cheerful, and patient in his practice. He took especial interest in young men just entering the profession, encouraging them by his sympathy and kindly aid. In 1855 he became a member of the Massachusetts Medical Society. He held many offices of trust and honor in the Medical Societies of the city and county, and in the charitable institutions of the place. In 1860 he was a delegate from the Massachusetts State Medical Society to the American Medical Society, which met that year at New Haven. In his very busy life he found but little time for literary work. One of his most important papers was on "The Surgical Treatment of Empyema," read before the Massachusetts Medical Society in 1875, and printed in the *Medical and Surgical Journal* the same year. It was considered a very valuable paper, and hastened the adoption of the mode of treatment recommended. His operations in ovariotomy were reported in a paper recently published in the *Medical and Surgical Journal*. The unusual proportion of successful cases in this operation was

doubtless due in a large measure to the untiring attention which he gave to the patients.

His steady hand, good judgment, and fertility in resources, made him a superior surgeon, and his practice extended far beyond the city and county of Worcester. The love for him as a man was as great as the confidence in him as a physician. The tidings of his death startled the community—the "mourners went about the streets." To many of those to whom he had been the trusted, skilful physician, he was also the friend, "the adviser," "the prop," upon whom it seemed as though their lives depended for sympathy and help. In many homes of all classes, tears were shed for the loss of one so truly loved.

This illness began on the night of April 9, with a severe chill, and in a few hours it was a decided case of pneumonia. His mind was entirely clear from first to last. He watched symptoms and treatment closely. No special anxiety was felt until about thirty-six hours before his death, when grave symptoms appeared, and hope grew faint. On the morning of the 17th, just one week from the commencement of the disease, suddenly and peacefully he passed away.

The tributes to his high position in the profession of his choice and love, came from many physicians in different parts of the country, who had known him only to respect him as a physician, and to love him personally. Those who seemed almost strangers to him were ready with loving memories of the impressions made by their intercourse with him in regard to patients, or in casual meetings. Dr. Clarke's general culture made him an agreeable man in society. His home was made attractive by his cordial welcome, for, however weary from professional duties, he was always unselfish and interested in the pleasures and pursuits of those around him. His cheerful voice and bright smile have cheered many hearts. His fine figure, quick movements and animated manner gave the impression of one even younger than he was. At the age of 55, in the height of usefulness and success, he has been called to rest from his labors.

On April 12 his large house was filled by those who had come "to mourn and to pray." The poor as well as the rich were gathered there to pay their last tribute of love and respect to the beloved physician and friend.

Sketch furnished by

L. F. WARNER, M.D.

Clark, Micajah, M.D., of Richmond, Va., was born on his father's plantation in Albemarle County, Va., near the present railroad station "Keswick," of the Chesapeake and Ohio Railroad, on the 28th of January, 1788; died at his residence in the city of Richmond on August 19, 1849. His father was William Clark, and his mother a daughter of Col. Tarleton Cheadle, an officer in the English army who emigrated to Virginia before the Revolutionary War. Dr. Clark was named after his paternal grandfather, Micajah Clark, one of the pioneer settlers of Albemarle County, who moved from Hanover County to Albemarle County when the latter was an unbroken wilderness, taking up a body of land of 40,000 acres, which is still known in the old county maps as "Clark's Tract," and its boundaries forming the initial points of surveys of later settlements.

From the loins of this courageous old pioneer sprang a large family, twelve children to be men and women grown, the youngest of whom was William Clark, and whose youngest son was Micajah Clark, the subject of this sketch.

Dr. Micajah Clark belongs to that historical family of Clarks of this county, which has furnished so many adventurous spirits, soldiers, governors, legislators, and professional men. Among them were Gen. George Rogers Clark, who conquered the northwest territory, Gov. Wm. Clark, of Missouri, and Meriwether Lewis (the two latter being the Lewis and Clark who made the Rocky Mountain expedition under Jefferson's administration), and many other prominent men during and after the Revolutionary War, and subsequently in the governments of the States of Kentucky, Missouri, Texas, and other Southern States. The blood was again well represented in our late civil war on the Southern side; among the most prominent were Generals John B. Clark, Meriwether L. Clark of Missouri, and General James Clark Dearing of Virginia.

Young Micajah Clark received the best education his section afforded, the last few years of his schooling being received at an academy at Louisa C. H., Va. From this school his grandfather (his father being dead) placed him in the clerk's office of Louisa County to afford him a practical business education. After a year of this apprenticeship, having a decided predilection for the profession of medicine, he went to Richmond and commenced the study of medicine with Dr. Adams, a talented and prominent physician, and a wealthy influential citizen, and at this time mayor of the city.

Dr. Adams soon discovered that he was both zealous and capable, and became much attached to him, took him into his family and treated him like a son. After the usual routine of study in a physician's office, Micajah Clark left for Philadelphia and entered the University of Pennsylvania, where he devoted himself to the study of his profession, taking for his motto "vota vita mea"—my life is devoted.

Finding his Virginia education defective, he added the higher classics of Greek and Latin, and later on French, to his medical studies. When he reached Philadelphia, through his credentials he had the good fortune to become an office student of the celebrated Dr. Physick, then in the zenith of his fame. Dr. Physick greatly valued the young student, and afforded him every facility in his studies, and soon discovered his talents, his great love for the profession, and his thirst for knowledge; and before his graduation, in speaking of him to one of the profession, remarked that he sometimes thought that "physicians, like poets, were born, not made, and that Clark was a born physician." Such an expression from such a distinguished light of the profession was a diploma in itself, and probably no other student of Dr. Physick's ever received a higher compliment from him. Dr. Clark graduated M.D. April 26, 1811, from the University of Pennsylvania.

The graduating class numbered sixty-four. His private examination took place before his professors on March 13, 1811, and his public examination on April 20, 1811, when he publicly defended his thesis, "Lithotomy," which was afterwards printed for circulation. From the fact that he chose a surgical subject for his thesis, it is probable that was a favorite branch of study with him. His diploma bears the date of April 26, 1811. After his graduation, finding his health much enfeebled by confinement and long protracted study, and being devoted to horseback riding, having been an enthusiastic fox and deer hunter in his boyhood, he took an extended tour on horseback, riding through Pennsylvania, New Jersey, New York, and the New England States as far as Massachusetts. On his return he found his health restored to its former vigor.

The question of a location to practise now engrossed his thoughts, which was partially decided in favor of New Orleans, and for this point, on the 25th of August, 1811, he mounted his horse in Albemarle County.

His horseback tour was again a full one, riding through many parts of Kentucky and Tennessee, not on the direct line but so as to see the country, and then through the Indian Nations, striking the Mississippi River at Natchez, at which village he sold his horses, and left January 5, 1812, for New Orleans upon the first steamboat which went down the Mississippi River (owned by Fulton, Livingston & Co.), arriving in New Orleans on the 12th of January.

Dr. Clark kept a very full diary of this tour, which is quite interesting, and a comparison with the geography of the present day shows the rapid growth of this country, what were then mere groups of houses being now great cities. Dr. Clark, finding the climate very enervating to him, and deciding, for various reasons, not to settle in New Orleans, but to return to Virginia, spent a few months in collecting a large and measurably complete herbarium of the flora of Louisiana, and left for Virginia on the 2d of May, 1812, returning by sea for Virginia *via* New York, reaching the paternal roof-tree in Albemarle County June 25, 1812.

Dr. Clark's final decision was to settle in Richmond, Va., where he had numerous relations and many warm personal friends.

His career there was an uninterrupted success, getting three patients the first day he opened his office; this practice steadily and rapidly increasing, until it taxed even *his* fine physique and untiring energies. He had during his entire professional life more practice offered than he could attend to, a practice probably never exceeded in the labor it involved by any of his contemporaries or successors in the city, booking for many years, even with the current small fees of his time—$1 per visit—from $13,000 to $16,000 per annum. The greatest amount booked in any one day was $120, though he accepted several calls to a distance, one to North Carolina, and others in his own State, for which he received $100 per day during his absence from town; but he finally refused these calls, as favoring the single patient was injustice to the many.

Dr. Clark in person was about five feet nine inches in height, weighing in middle age from 170 to 180 pounds, had a rather large head, was very fair, with dark brown hair, with clear piercing blue eyes, a pleasing face, with a frank open expression and winning smile. His presence and air would arrest atten-

tion, and the easy grace of his manner would invite acquaintance, which under the sunny influence of his warm, kind heart and engaging qualities rapidly ripened to friendship. He was warm hearted and true, a man who made few enemies, but many friends—friends who loved him with their whole hearts, and were true through life, even to his wintry days, and cheered his last hours when bowed down by infirmities and disease, brought on mainly by exposure to weather through years of laborious practice; he who had relieved so much suffering and pain at last lay down for a few months to be ministered to in turn.

Few young physicians have entered the practice of their noble profession with such bright prospects as Dr. Clark had on his entry into Richmond, Virginia, or can show such a career of usefulness and success. He entered Richmond as a physician, young, talented, well off in the world's goods, considered handsome, a travelled gentleman of good birth and breeding, of tried courage, with fine presence and manners, and the *protégé* of Dr. Adams, a leading citizen, who loved and admired him. It was no wonder that his success was instant and great—a success which his own great qualities as a physician caused to be an uninterrupted one. He was considered an acquisition to the gay society, then the best in the State, and was quite a toast with the fair sex, and having polished manners and rather rare talents as a conversationalist he well maintained his position.

He was a successful physician, Dr. Physick said "a born one," and owed some of it to his keen perception, detecting the nature of a disease in its earliest symptoms, and to his inspiring the patient with profound faith in his skill, his very entry into the sick-room inspiring hope and preparing a favorable condition for his remedies. This talent of discovering promptly the true ailment was of great value in treating children too young to tell of their sufferings and the location of their pains.

His theories of many diseases, consumption, scarlet fever, Asiatic cholera, and others, were novel in his section, because they were in advance of the time, and though the whole of them may not have originated with him, they were such as are held to-day generally by the profession at large.

He was notably successful in treating Asiatic cholera during the epidemic of 1832. His first patient died, under the conventional treatment of the day. The shock of this death caused him to make a careful re-study of the case, which convinced him

that, though the patient may have died from the disease, the treatment was not based on scientific principles, and under the light of that experience and his reflections his treatment and remedies were changed with great success. The cases attended must have been numerous, as he mentioned years afterwards that for three weeks during the epidemic he only averaged two to three hours' sleep during the twenty-four, never once undressing to go to bed.

Among his qualities was the power of sustaining long-continued exertion and fatigue, without rest or sleep, going 48 or even 72 hours if occasion required, without the latter relief. This strain in his younger days was no doubt frequently pushed to its limits, and made serious inroads upon his iron constitution, which finally succumbed to the demands made upon it.

Reared in the country, fond of all manly sports, a keen hunter and fine rider, open air exercise agreed with him, and he followed his practice for nearly forty years on horseback, keeping generally three horses in his stables for service.

In middle age, at the solicitation of his family, he accepted the shelter of a carriage, but after using it a year, said it did not agree with *him*, and greatly exposed *the driver*, and he mounted his horse again.

Like many of his profession, he was careless in money matters; generous to a fault, his hand was always open to the needy, and a free lender to those who asked. He lost his entire patrimony, an ample one, and many thousands besides, by endorsements for friends. He was a poor collector, seeming averse to presenting accounts, frequently preferring to borrow, to collecting even from those desiring to pay, apparently disliking to associate money with the practice of his profession, which, he said, was one of humanity, to do good and relieve suffering; yet with all this he was methodic in his accounts, which he accomplished in a manner characteristic of the man. During nearly his whole career, he kept in his family, free of all charge, some student, worthy, but poor in means, who had the use of his large library, and the advantage of seeing a full office practice, and pecuniary assistance for college fees, if needed, requiring only in return for all this, that the student should at night of each day enter the visits and business of the day, and post the ledger regularly. Thus his books were well kept, though a full percentage of the accounts was never drawn off,

his books after his death showing over $100,000 of unpaid accounts. He had a large privileged class against whom he never allowed an account to be presented, among whom were poor widows and orphans, ministers of all denominations, and school teachers.

Though Dr. Clark was "suaviter in modo," he was also "fortiter in re," dignified, but firm and bold in his opinions, with a hearty outspoken scorn for everything diverging from the strict line of honor, or in any degree unprofessional. He was proud of his profession, and held it a badge of honor. He was sensitive to suffering, and though he held the knife with firm, unsparing hand, he rather avoided attending to surgery and midwifery.

Dr. Clark was appointed Surgeon in the Army in the war of 1812, and served for two short periods with the troops at Craney Island. Among other positions of honor proffered him and declined, was a Professorship in the Richmond College of Medicine.

He was a kind and affectionate husband, a tender and indulgent father, and raised a large family of children to whom his smile was reward, and his look of mortification at misdoing the severest punishment—the only punishment he ever used. No child ever felt his hand except in a caress. He was a kind and liberal master to his servants and slaves, who were devoted to him. He was very popular with the African race, many of whom believed that he held the power of life in his hands, and they followed his remains in crowds to the grave.

Dr. Clark's health began to give way in 1848; in the spring of 1849, his whole system became enfeebled, and he became unable to attend outdoor practice; there seemed a general breaking down of his system, though his lungs seemed the most vital organs attacked. He expired on the 19th of August, 1849, conscious to the last, giving last words to his family, and died whilst sending a message to an absent son, his namesake.

During the last few years of Dr. Clark's life, he suffered from pecuniary embarrassments, which increased from his inability to attend full practice, and his death left his family in penury, from which they were partially relieved in a few years by an inheritance from a deceased brother's estate.

Dr. Micajah Clark was married on the 29th of December, 1819, to his second cousin, Miss Caroline Virginia Harris, the

oldest daughter of Benjamin James Harris, a prominent merchant of Richmond, Va. She survived him eleven years.

By her he had a large family of children, of whom only three (sons) are now living. His youngest son, David B. Clark, took his father's profession, and is now practising medicine in the city of New York. His oldest son, Dr. William James Clark, inherited his father's active mind, but inclosed in a delicate frame. The brightness of his intellect will be seen, when it is stated that he graduated at the University of Virginia in his sixteenth year, and at the University of Pennsylvania, when he was nineteen years old, and was a practising physician in Richmond before his twentieth year. He died of malignant bilious fever, the 19th of August, 1853, in the 29th year of his age.

M. H. CLARKE.

DAILEY, E. D., M.D., son of Rev. David Dailey, of the M. E. Church, Philadelphia Conference, was born at Mount Holly, N. J., September 30th, 1824, and died at Smyrna, Del., October 4th, 1865, and was there buried. He was educated at Washington College, Chestertown, Md.; studied medicine with Dr. Rechbaugh, of Chester County, Pa., and graduated at Philadelphia in 1848. He went into the army of the United States in the spring of 1861 as a surgeon of volunteers; was afterwards made brigade surgeon, and was promoted to medical director of the 11th corps. He practised his profession in Smyrna ten years, and was one of the most popular and successful physicians known to the community. He was genial, sociable, and in every way companionable, and endeared himself to the people as few practitioners have ever done in that community. He was a fellow of the State Medical Society of Delaware, and at one time its President. Became a member of the American Medical Association in 1858. As a member of Medical organizations he was always interested, and always anxious to contribute his share to its success. He leaves a wife and four children.

C. H. RICHARDS, M.D.

DRAPER, LEMUEL JAMES, M.D., U. S. Navy, was the eldest son of Samuel and Anna T. Draper, of Milford, Kent County, Del., and was born the 14th of May, 1834; died while on duty in the city of St. Louis, August 31, 1879. His father is the son of

Henry Draper and Hester Collins; his mother is the daughter of Benjamin Yoe and Araminta Collins, all of Delaware, who in their day enjoyed a well-merited distinction in society. His aged father and mother still survive. Dr. Draper's early struggles for educational and scientific advantages were persistent, and marked with eminent success. From the Academy of Milford he went to the University of Pennsylvania, at which institution he graduated M.D. in 1854.

He was a man of far more than ordinary qualities. He was of untiring industry in the pursuit of knowledge and in disseminating the results of his researches. As a physician, he was regarded by those who knew him well as possessing learning and skill in the healing art. He kept well abreast of the times in his profession, constantly consulting the text-books and periodicals in medical science and surgery.

He practised medicine for a time in Wilmington, Del., and for many years in Washington, D. C. In the early part of the late civil war he entered the United States Navy, serving as assistant surgeon. After the war, he was also examining surgeon of the Pension Bureau in Washington.

He was twice married. His first wife was Mary Ellen Mudd, the daughter of Thomas Mudd and Ellen Taylor, to whom he was married October 18th, 1860. Dying, she left one daughter, Rose De Lima Draper, resident in Washington, D. C.

He married his second wife, Miss Mary E. Owen, daughter of Andrew Balmain and Amy E. Denham, in February, 1870. The children of this marriage were one son and three daughters, all of whom reside with their mother in Washington, who draws the navy pension of assistant surgeon for herself and children.

In July last, he was ordered by the Secretary of the Navy to Chicago and St. Louis, to serve on the examining board for the admission of apprentices to the training ship "Michigan." In the latter city, after extreme suffering for several weeks, he died; and his body, accompanied by his wife and his physician, Dr. Green, U. S. N., was conveyed to Washington, and interred by the Masonic fraternity in the Congressional cemetery. He was a member of the Foundry M. E. Church, where were held the funeral services. He was a member of the Medical Society and of the Medical Association of the District of Columbia; and also a member of the American Medical Association.

Data from his family.

J. M. T.

Finley, Clement A., M.D., retired Surgeon-General U. S. A., was born at Newville, Cumberland County, Pa., 1797; died at his residence in Philadelphia, September 8, 1879.

He was the son of Samuel Finley, an officer of the Virginia line in the Revolutionary war, and was appointed receiver of Government moneys, from the sale of public lands, by General Washington, when President.

The subject of this sketch was educated at Washington College, Pa. His office medical studies were pursued at Chillicothe, Ohio. He then attended lectures at the University of Pennsylvania, where he graduated M.D. in 1818. In 1832 he married Elizabeth, daughter of Dr. Samuel Moore, Director of the United States Mint at Philadelphia.

J. M. T.

His military record: Appointed Surgeon's Mate, First Infantry, Aug. 10, 1818; Assistant-Surgeon, June 1, 1821; Surgeon, July 13, 1832; Surgeon-General, May 15, 1861.

Retired April 14, 1862, at his own request, having served over 40 years. Appointed Brigadier-General by brevet, March 13, 1865, "for long and faithful services in the army."

Service: On duty with First Infantry, to June, 1821; in Louisiana, to Aug. 1822; at Fort Smith, Ark., to May, 1824; at Fort Gibson, C. N., to Sept. 1825; in Florida, to March, 1826; at Jefferson Barracks, Mo., to May, 1827; at Camp Leavenworth, Kan., to Dec. 1827; at Jefferson Barracks, Mo., to Sept. 1828; at Fort Dearborn, Ills., to May, 1831; at Fort Howard, Wis., to May, 1832; on leave to Sept. 1832; again at Fort Howard to May, 1833; on leave to Dec. 1833; on duty with Dragoons to Sept. 1834; in arrest at Jefferson Barracks, Mo., to March, 1835, and on duty at same post to Feb. 1836; Medical Director in Florida (Indian war) to May, 1838; on leave to July, 1838; at Fort Monroe, Va., to Nov. 1839; at Buffalo, N. Y., to Sept. 1840; at Carlisle Barracks, Pa., to May, 1844; at Fort Monroe, Va., to Aug. 1846; Medical Director of General Taylor's army in Mexico, to Dec. 1846; on detached service at Austin, Texas, to Feb. 1847; member of Army Medical Board at New York, to May, 1847; at Fort Monroe, Va., to July, 1847; en route to, and at Vera Cruz, to Dec. 1847; on leave to Feb. 1848; on duty at Newport Barracks, Ky., to Dec. 1849; at Jefferson Barracks, Mo., to May, 1852; at St. Louis, Mo., to Oct. 1854; at Phila-

delphia, to May, 1861; as Surgeon-General at Washington, D. C., to April 14, 1862, when he retired; unemployed to date of his death.

J. S. BILLINGS, M.D.

FOURGRAND, VICTOR J., M.D., was a descendant of one of the Huguenot families in South Carolina, in which State he was born February 1, 1816; died at San Francisco, Cal., January 12, 1875. At the age of ten years he was sent to France to procure the advantages of an education, then not attainable in his native country, and graduated in the Arts at the College of Agen, a branch of the University of France, in the twentieth year of his age. Returning to his home, he entered at once upon the study of medicine, and in 1838 received the degree of M.D. at the Medical College of South Carolina. Ambitious to excel in his profession, he soon revisited Paris for the purpose of availing himself of the advantages which the schools and hospitals of that city afforded. After three years of study under the great masters of the French capital, he returned to Charleston, and entered at once into a practice which gave promise of being eminently successful. He saw before him, however, a wide field, and one more suited to his somewhat adventurous nature, in the then rapidly growing West, and in 1842 took up his home in St. Louis, Mo. Here his skill as a practitioner of medicine was soon recognized, while his ability as a writer and his scholarly attainments brought him into prominence as one of the editors of the *St. Louis Medical Journal.*

The news of the possession of California by the United States awakened in him the desire for new adventures, and in the spring of 1847 he left St. Louis for the long and tedious journey across the continent. After many trials and hardships, which few except the early pioneers along the same route can fully realize, he reached San Francisco in October, and soon commenced the practice of medicine. Here he remained, with various temporary intermissions, during which he served one term in the legislature of the State, until 1857, when he removed to Sacramento, and entered upon the practice of his profession in that city; but in 1862 his business and property interests again called him to San Francisco, where he remained engaged in the active duties of a successful practitioner to the date of his death.

Dr. Fourgrand was a writer of no ordinary ability. His

essays, mostly on medical subjects, were characterized by clearness and conciseness of style, and clothed in language which could not fail to attract. He was a close student, fond of the literature of his profession, and though possessing a high admiration for the authorities of the French school and an unwavering confidence in their teachings, he did not neglect to profit by the writings of the English, German, and American teachers. Many of his papers on medicine are to be found in the medical journals of the Pacific coast. In 1858 he published a concise and critical essay upon "Diphtheritis." In this essay he adopted the views of Bretonneau, but, in later years, greatly modified his opinions both as to the nature and treatment of this disease. In 1862–3–4 he was one of the editors of the *Pacific Medical and Surgical Journal*, and for a portion of his time had sole control of its pages. Early in life he commenced the preparation of a work on the "History of Medicine," and chapters therefrom appeared from time to time in the medical journals under his charge. The work, I believe, was never completed, although ample materials for its successful prosecution were at his command.

The record of Dr. Fourgrand through life was an honorable one. He was frank, open-hearted, and ingenuous; there was no hypocrisy in him; not easily won, perhaps, but when once his friendship was gained he was true as steel. He was one of the early pioneers to California, and his death was lamented by a large circle of friends—by many who had shared his hospitality —by many more who had been the recipients of his kindly offices and skilful attention in the sick-room. He was an active and influential member of the State and local medical societies, and of the American Medical Association.

F. W. HATCH, M.D.

Franklin, John J., M.D., one of the oldest physicians in California, died at his residence May 9, 1875. He graduated from Transylvania University, Kentucky, in 1828. The date of his arrival in California is not known to the writer, but at an early day he settled in Columbia, Sonora County, in this State, where he devoted himself assiduously to the practice of his profession. To this profession he was ardently devoted, and sensible of the advantages to be derived from associations with others, and from the occasional interchange of views and experience with

his fellow laborers throughout the State, he took an active part in the reorganization of the State Medical Society in 1870, being one of its charter members. He was also a member of the American Medical Association. At his home in the mountains he was held in the highest admiration by the physicians in his vicinity, and was beloved by all who knew him. In the language of one of his medical friends and associates, whom the exigencies of the profession frequently called to meet him in consultation, "he was one of nature's noblemen."

Dr. Franklin died of pneumonia, following a severe injury, which resulted from the upsetting of his buggy while crossing a stream in the mountains.

F. M. HATCH, M.D.

GODDING, ALVAH, M.D., was born in Troy, New Hampshire, November 5, 1797; died of erysipelas at his residence in Winchendon, Mass., January 11, 1875. He was a graduate of Bowdoin Medical College, Brunswick, Maine, of the class of 1825. Had he survived a few months longer he would have completed a practice of fifty years, which, with the exception of a year or two, was in the town of Winchendon, where he died. A native of New Hampshire, he studied medicine with Dr. Amos Twitchell, of Keene, New Hampshire, who was the medical authority of that region, and listened to the lectures of Dr. Nathan Smith, then the leading medical mind of New England, a mind that has sent something of its vigor through the second down to the third generation of doctors. He received his medical degree from Bowdoin College in 1825. In Dr. Godding the impress of this teaching was visible throughout his long and active career. He had a hard working life. At the height of his fame his practice included a circuit of more than twenty miles of that semi-mountainous region, and though in the gradual filling up of the country with villages and local physicians his routes grew shorter, he was still called upon to ride over those long hill roads in consultation, and he continued in active country practice to the end.

As a practitioner he was eminently successful, and the confidence reposed by the community in his medical skill was fully warranted by the results of his practice. He did not grow rusty and obsolete in his medical knowledge, but was always a student and willing to profit by the latest word of science, not

forgetting, however, in the brilliancy of the new the value of the lessons attained by "old experience;" he believed in science, but he practised common sense.

I know that in this record there is nothing remarkable; it is the common history of a great army of country practitioners, whose life work is being summed up in the obituary of every year, they are the obscure martyrs of our time. But, unless I as his son see it with too partial eyes, there was something in his life outside of his profession that deserves a passing record here. It was the position that he took in the community in which he lived; he did not wait to learn what others thought about any question of public interest in order to follow their lead, and so make principle synonymous with interest; he never asked the bearing of his action upon his professional patronage, only what was it right for him to do?—then he did it. In temperance, in politics, in religion, he took his stand fearlessly, remembering that he was a man and a citizen before he was a physician, and that it became him to lead rather than to follow. Hence men honored him, and the sincerity of his life was to them an earnest of the honesty of his professional work.

He was truly a benevolent man; he grew up and grew old in a community where there were few men of wealth, and of his daily life it may be said "the poor were always with him," and he was poor with them, and yet they did not go away empty. "The best man I ever knew," said one who had been his patient. Of his thoughtful kindness and the charity of his life the region where he labored is to-day full of pleasant reminiscences that make no noise nor public record, yet go not unrecorded elsewhere. Among those hills they still speak of him as the "good doctor."

In 1846, while convalescing from a severe attack of sickness, he spent several months in the hospitals and clinics in one of the colleges in the city of New York. In 1851 he was chosen to represent his town in the legislature, and was a member at the time Charles Sumner was elected to the Senate of the United States. The doctor became a fellow of the Massachusetts Medical Society in 1849, and was a warm supporter of that body. Dr. Godding was sent a delegate from the Worcester County Medical Society in 1860 to the American Medical Association. He also attended other meetings, and was a firm supporter of regular medicine. Dr. Ira Russel, his partner in practice, pub-

lished a sketch of Dr. Godding's life and professional labors in the Winchendon *Journal* of January 22, 1875, from which we quote the following:—

"Dr. Godding was slow and cautious in the formation of opinions, but when his mind was fully convinced he adhered to his convictions with great tenacity. He was among the early pioneers in the temperance and anti-slavery reformation, a consistent and liberal supporter of the Christian Church to which he belonged. As a physician he was kind, cautious, and attentive, responding to calls night or day with alacrity. He was true to the medical profession. He believed medicine a science to be learned, and that no one is fit to practise the healing art who is ignorant of the structure and function of the human system. All kinds of quacks, charlatans, and pretenders received no countenance at his hand. His moral nature revolted at the idea of secret nostrums; and to conceal any valuable discovery in medicine from the world was in his estimation, as it is in that of every honest physician, a crime against humanity. Dr. Godding grew old doing good. He was drawing near to the labor if not the sorrow which the Psalmist allots to fourscore years. Younger men in the profession were learning to take life easy, but to him duty held up ever the one standard of the golden rule. So when the appeal came in that winter night for a forlorn hope to save the mother and child, others might and did refuse; he could not, and he answered the summons with his life."

On the white slab that marks his resting place this sentence stands, and I think he has merited it:—

"He that loseth his life for my sake shall find it."

W. W. GODDING, M.D.

GRAHAM, JAMES, M.D., of Cincinnati, Ohio, was born in New Lisbon, Ohio, in the year 1818; died of uræmia, at his residence, October 6, 1879.

He was educated in Jefferson College, Washington County, Pa., and graduated in medicine in the University of Pennsylvania.

Comparatively little is known of his earlier years in the profession, but when yet very young he settled in Cincinnati, where his talent and clear-headedness soon attracted attention, and established for him an enviable reputation.

Dr. Graham became a member of the Faculty of the Medical College of Ohio, in 1854, as teacher of Practical Medicine, and held the position for twenty years. He resigned his chair in 1874, on account of ill health, and because he thought his day of usefulness on the wane, but he continued to practise for some time longer.

Dr. Graham wrote little, but he was an ardent student, and a forcible, logical, and attractive lecturer. His language was simple, but his words were well chosen, and delivered so as to convey exactly what he meant. He excelled as a diagnostician and clinical lecturer, and as a consequence was an excellent therapeutist.

He was independent in thought as in action; while he valued authority us highly as any, he relied mainly on his own observation for facts. He had an innate sense of honor, which generated a sensitive regard for the rights of others, and made him considerate of his brethren and kindly to the poor. The doctor was for very many years on the staff of the Cincinnati Hospital; an active member of the local and State Medical Society, and a member of the American Medical Association.

STARLING LOVING, M.D.

Green, Henry Prentice, M.D., of Madison, N. J., it is supposed, was born in Vermont; died in Madison. He attended, in the winter of 1825–26, the course of medical lectures delivered in the College of Physicians and Surgeons in the city of New York, and was the office student of J. Smith Rogers, M.D., and James M. Pendleton, M.D., who together with Fred. G. King, M.D., and R. K. Hoffman, M.D., delivered a course of lectures on all the branches of medicine, in 21 Warren Street, New York. He claimed to be the son of a Baptist minister then living in Vermont, from which State he came to New Jersey and taught school, studied medicine some time with Dr. Bishop, Bottle Hill, now Madison, Morris County. He married a Miss Crowel. They had some family. He died at Madison, New Jersey.

JOHN BLANE, M.D.

Hall, Oslino Bracketh, M.D., was born in Northfield, N. H., October 17, 1819; died of pneumonia, April 21, 1880. He was of Puritan stock. He received his early education at the neigh-

boring academy, and graduated at the Dartmouth Medical School, and began the practice of medicine in Kingston, Mass., in 1844. In 1847 he removed to Natick, where he entered into partnership with Dr. Hoyt. In 1852 he began a course of study in the hospitals of Paris, and was for two years under the instructions of Nélaton, Velpeau, Ricord, and other eminent physicians and surgeons. Returning in 1844, he settled in Boston, where for nearly twenty-six years he devoted himself to the most benevolent and laborious of professions. In 1862, when Gov. Andrew called for volunteer surgeons to go to the front, he responded, and there contracted malarial fever, from which he never entirely recovered. For sixteen years he was a councillor of the Massachusetts Medical Society, and for several years trustee of the Suffolk Medical Society.

On April 16 he was seized with acute pneumonia, soon involving both lungs, and died after five days' illness. He was a man unusually beloved, very successful in his profession, generous, and ever ready to respond to the calls of duty. His benevolence and kindness of heart made him sensitive to the needs of the poor, and his large practice among them was always most willingly rendered. The scene on the day of the funeral was touching in the extreme, as the poor gathered in large numbers to pay their last tribute to their friend and benefactor, and mourned with sincere grief for what seemed to them their irreparable loss.

Dr. Hall was married November 21, 1864, to Mary P. Cowles, of Ipswich, Mass., who survives him.

L. F. WARNER, M.D.

HARRIS, STEPHEN R., M.D., was born in the city of New York in 1801; died in San Francisco April 27, 1879.

He graduated in the arts at Columbia College, in his native city, and subsequently became a student of the late Professor Alexander H. Stevens. He attended lectures at and received his diploma in medicine from the College of Physicians and Surgeons, New York, in 1876. Dr. Harris began to practise in New York City. He won the esteem of a large circle of friends, and was appointed at various times to positions of honor and trust, requiring professional ability and administrative talent. He left New York February, 1849, for California, where he soon rose to distinction in his profession. Besides, he held,

during his residence in San Francisco, several responsible public positions. He was elected Mayor of the city in 1851; in 1853 he was elected Controller; and Coroner in 1857. Again, in 1873, he was appointed by the Board of Health to the position of Resident Physician of the San Francisco City and County Almshouse, but resigned after serving only a short time. He was a member of the State and local Medical Societies, and a member, by invitation, of the American Medical Association.

Dr. Harris had many friends both in and out of the profession, and his death was universally deplored.

F. W. HATCH, M.D.

HATCH, THURSTON B., M.D., was born in Kenosha, Wisconsin, October 19, 1845, and died at San Francisco, California, March 19, 1875. When but five years of age, he came to California with his parents, who settled in Sacramento, where they still reside, his father, F. W. Hatch, Sr., being one of the most prominent physicians of that city, and of the State. At an early age the subject of these remarks was sent to the common schools of the city, and at once manifested such an aptitude for learning as to place him in the front ranks of all of his classes, a position which he maintained until he graduated from the high school, at the very early age of 14. His tastes and predilections induced him to commence the study of medicine with his father, under whose fostering guidance he was prepared for matriculation at the Jefferson Medical College, Philadelphia, where he attended two full courses of lectures, and doubtless would have graduated at the age of 19, had he presented himself for examination. Being too young, however, to obtain his diploma, and being determined to qualify himself in the most thorough manner possible for the arduous duties of his profession, he entered as a student at the Long Island Hospital College, New York, from which he was graduated in 1865, before he had attained to the years of his majority. His close attention to study, at so early a period in his life, so impaired his health as to render it necessary for him to seek recreation and freedom from mental labor. Accordingly, upon his return to California, after graduating, he spent about two years in Santa Barbara and San Diego, for the benefit of his health. Having experienced much benefit, and being anxious to engage in the duties of his profession, he obtained the position of surgeon on one of the

Pacific Mail Steamship Company's steamers between San Francisco and Panama, and subsequently between San Francisco and China. He continued in this service for about three years, and his health being still further improved, he accepted the position of medical director of the Union Mutual Life Insurance Company of Maine for the Pacific coast, residing in San Francisco. His adaptability for the special duties incumbent upon him soon became so apparent, that a friendship at once sprang up between himself and Mr. H. H. Johnson, the manager of the Company for the Pacific coast, which, we are informed, "grew and daily intensified." He was elected a member by invitation of the American Medical Association in 1871.

He was a ready and brilliant writer, as the readers of the *Coast Review* and the Life Insurance department of the *New York Medical Record* for 1872–73 will bear witness. The editor of the former journal, who knew him well and intimately, but re-echoes the sentiment of the profession upon the Pacific coast, when he says, "Dr. Hatch loved his profession, and spared no amount of trouble and study to keep up with the advancing tide of thought and discovery; but outside of his profession, his abilities were no less recognized. The readers of the *Coast Review* are indebted to him for more than one racy article or humorous sketch; yet his modesty ever prevented him from accepting the credit to which his merit entitled him. But above all the accomplishments of this character, for which, in our mind, he stood pre-eminent—peerless—was a calm, pure intellect, that enabled him, at a glance, to detect the true from the false; that made him thoroughly detest shams and deceits; that placed him ever on the side of right, no matter with what specious sophistries error was clothed. A moral courage that enabled him to denounce whatever of wrong he found; that enabled him to espouse the cause of right and justice; that gave him a warm, tender heart for those dear to him; an unwavering devotion to friendship. Those who have known him well will not think all this an idle rhapsody, and many can testify to its truth. He was a realization of the ideal youth forms for its friendships.

"But in the fulness of life—on the threshold of a brilliant career—filled with the conscious possibilities of useful acts and noble deeds, all unwarned, the light of life went out. On the 29th of March, while at the dinner table of his uncle, Gen. C. I.

Hutchinson, a slight cough started a hemorrhage. Every effort was made to stay the life-tide, but in a few minutes the tragedy was ended, and the noble heart had ceased to beat."

W. R. CLUNESS, M.D.

HOLMES, DANIEL, M.D., was born in Oxford, Chenango County, N. Y., on the 28th day of April, 1818; died at Elmira, N. Y., February 15, 1869. His father died when he was a boy, leaving a family of small children with limited means for their mother to support. The subject of this notice early developed a strong desire for an education. After completing his primary course at the common schools, he entered Oxford Academy, where he remained three or four years. He had long since determined to select medicine for his life work, and in 1842 began his medical studies under the instruction of Dr. Theodore Wilder, of Springfield, Bradford County, Pa. He attended his first course of lectures at Geneva Medical College in 1843. At the close of his lecture course he placed himself under the instruction of Dr. Barnes of Le Raysville, Bradford County, Pa. In 1849 he attended another course of lectures of the University of Pennsylvania and graduated. He settled in Le Raysville, where he practised eight years. He then removed to Smithfield, Pennsylvania, where he continued in practice for five years. He then went to Canton, Pennsylvania, where he was in successful practice until he entered the army in 1861. He entered the service of his country in December, 1861, and began his duties at Church Hospital at Harrisburg. In February he was transferred to the Forty-sixth Regiment Pennsylvania Volunteers as Surgeon. In April, 1862, he was promoted to Brigade Surgeon, General Doubleday's brigade, at Washington.

In May following the brigade was ordered to Fredericksburg, Virginia, and he was placed in charge of the general hospital at that place. When the United States forces retreated in July he was in charge of the removal of the sick and wounded to Washington. His arduous labors brought on severe illness with continued ill health following, which compelled his resignation in December, 1862. He was unable to practise until September, 1863, when he removed to Philadelphia, Pa., for purposes of study, where he remained until April, 1866, when he had an attack of hemorrhage of the lungs.

Upon the advice of eminent physicians he removed to Elmira,

New York, in September, 1866, where his health improved so that he was able to do considerable practice. He had long been a member of Bradford County Medical Society. After moving to Elmira, N. Y., he joined the Chenango County Medical Society and the Elmira Academy of Medicine, in both of which he took an active interest. He was also a member of the American Medical Association.

In August, 1842, he married Miss Louisa, daughter of Moses Wood, of Springfield, Bradford County, Pa., who with an only son still survives.

C. W. BROWN, M.D.

HUFF, SANFORD W., M.D., of Sigourney, Iowa, was born in Hamburg, Erie County, N. Y., December 25, 1826; died at his residence in Sigourney, Iowa, November 7, 1879. Having received a good academical education, he studied medicine, and then attended lectures at the Buffalo Medical College, where he graduated M.D. in 1851. He practised for some years in the State of New York, and removed to Iowa in 1857 and settled at Sigourney, where he enjoyed a good share of professional business. In 1862 he entered the army as Surgeon of the 12th Iowa Infantry, and served four years.

Data from H. B. Ransom, M.D.

J. M. T.

HUN, EDWARD REYNOLDS, M.D., oldest son of Dr. Thomas Hun and Lydia L. Reynolds his wife, was born at Albany, N. Y., on April 17, 1842; died at Stamford, Conn., March 14, 1880. His ancestors were among the early Dutch settlers of this part of the country, and his father is one of the ablest practitioners of medicine, and best known citizens of Albany. He had, therefore, every advantage that wealth and social position could confer. After graduating from Harvard University in 1863, he at once began his medical studies, and received his diploma from the College of Physicians and Surgeons in New York City, in 1866, having had as his preceptor Dr. Willard Parker, then Professor of Surgery in that institution. Dr. Hun went abroad for a year after his graduation in medicine, and devoted himself assiduously to adding to his professional attainments in the hospitals of Europe. On his return he took up practice in his native city, and during the succeeding winter again went abroad for a few months, but immediately after coming back went on with

his practice, which soon grew to be very large and lucrative, so that he early began to work too hard for his own good. He was for some years special Pathologist to the New York State Lunatic Asylum at Utica, and in 1873 was appointed lecturer on Physical Diagnosis in the Albany Medical College. In the reorganization of the College Faculty in 1876, he was appointed Professor of Diseases of the Nervous System, and retained this position until the time of his death. He was also consulting physician to the Cohoes Hospital; attending physician to the Albany, St. Peter's, and Child's Hospitals; consulting physician to the Day Nursery; attending physician to the Protestant and Roman Catholic Orphan Asylums; in short, he never failed to give his professional assistance to every charitable institution that asked for it. From 1872 to 1876 he was also Surgeon of the 10th Regiment, N. G. S. N. Y. He was a member of the American Medical Association; of the New York State Medical Society, and at one time its Secretary; of the Albany County Medical Society; of the American Neurological Association, and for many years corresponding member of the New York Neurological Society.

He contributed to medical literature the histories of a large number of cases, always carefully watched, accurately reported, and of scientific interest; and among his more important papers were articles on Trichina Spiralis, Hæmatoma Auris, and the Pulse of the Insane.

Early in 1876 Dr. Hun had the misfortune, while returning from a visit to a patient in the country, to be thrown from his carriage with such violence as to be rendered unconscious, and he remained so for some hours. He recovered from the immediate effects of the injury, but only a few months afterwards his health began to fail, almost imperceptibly at first, and about a year before his death he was obliged to relinquish the practice of his profession. He went first to the South, and then spent the summer of 1879 and the succeeding winter in the country, with such manifest improvement to his health that it was hoped that he would permanently recover. On March 12, 1880, he was suddenly seized with a convulsion, became unconscious in a few seconds and never rallied, and died at Stamford, Conn., on March 14, 1880.

The post-mortem examination, which was made with great care by Dr. E. C. Seguin, showed no evidence whatever of any constitutional disease.

Manifest atrophy of the anterior lobe of the left cerebrum was found, and the arachnoid covering it was thickened and in a condition of chronic inflammation; these conditions accounting fully for the symptoms exhibited during the last year of his life.

The point of injury to the scalp, at the time the doctor was thrown from his carriage, was directly over the centre of the brain lesion, and there can be no doubt that this latter was of traumatic origin. The immediate cause of death was found to be uræmia, the kidneys being deeply congested, and the urine in the bladder loaded with albumen.

Dr. Hun was a man of unusual attainments in his profession, of much general reading and culture, respected and beloved by all who knew him, and apparently with as brilliant a career before him as his best friend could wish. The church, so crowded that many were unable to gain admission on the day of his funeral, showed, more forcibly than any words can, how widely, as well as how deeply, his early loss was felt.

LORENZO HALL, M.D.

JEWELL, WILSON, M.D., was born in Philadelphia, Pa., on November 12, 1800. He was the son of Kenneth Jewell, a tradesman who gave him as liberal an education as his means would permit.

He graduated as Doctor of Medicine at the University of Pennsylvania in 1824, having presented for his thesis "Nux Vomica in Paralysis." He then went as medical officer on a packet ship sailing to China, and remained several months at Calcutta and other foreign ports. On his return to the United States he married Miss Rachel Lyon, an orphan, who resided with her guardian, the Rev. Dr. Wm. Staughton, at Georgetown, D. C., and commenced practice at Branchtown in Montgomery County, Pa., where he remained about a year, when he removed to Hamilton Village, on the Schuylkill River; but in 1828 we find him in Philadelphia. He located himself in the "District of the Northern Liberties," where he continued to practise for several years, devoting himself especially to midwifery and diseases of women and children.

In 1837 he was induced by a friend to go to the "far west," as Illinois was then considered, and for two years he resided at Alton, Ill. But he was disappointed in his prospects, and in 1839 he returned to the city of his birth, where he continued in practice until his death.

Dr. Jewell was a member of the Board of Health, and its President for several years, and devoted much of his attention to hygiene, vital statistics, and sanitary laws, and was instrumental in framing the registration laws of births, marriages, and deaths. He was a fellow of the College of Physicians, and in 1853 read a report of the outbreak of yellow fever in Philadelphia during that year. He was a member of the Philadelphia County Medical Society, took a lively interest in its welfare, and was its President in 1856. He was also President of the Quarantine and Sanitary Commission, which met in Philadelphia in 1857. He became a member of the American Medical Association at its formation, and was elected its Vice-President in 1863. In the following year, when it met in Chicago, in consequence of the death of its President, the venerable Dr. Eli Ives, it became his duty to deliver the retiring address. He was also a member of the Pennsylvania State Medical Society, and its President in 1863. His wife died of pneumonia on May 22, 1865, after a short illness. She had been the mother of nine children, two of whom, a son and daughter, are living now.

On April 18, 1867, he married Mrs. Charlotte McMullan, a widow, who had been his patient for many years, and soon after they sailed for Europe, where he remained about four months; but they returned sooner than they had intended, in consequence of the serious illness of his eldest son, who died two weeks after their arrival home.

Whilst in Italy the doctor had two attacks of vertigo, oppressed breathing, and loss of consciousness, attributed to a valvular disease of the heart, with which he had been affected for several years. He died suddenly whilst sitting in his office after dinner on November 4, 1867.

Dr. Jewell was a member of the Baptist denomination for forty years, always noted for his usefulness amongst them, and held the office of deacon at the time of his death. He was faithful in the performance of his duties, both public and private, and had the esteem and confidence of his patients and friends. He despised every form of quackery, and was earnest in his endeavors to elevate the standard of medical science.

At his death the Philadelphia County Medical Society passed resolutions expressive of his character, ability, and worth.

WM. T. TAYLOR, M.D.

KINCHALOE, DAVID ANDERSON, M.D., of Sardis, Miss., was born in Barren County, Ky., October 18, 1823; died of disease of the liver at his residence in Sardis, Miss., September 9, 1878. He was the son of E. Kinchaloe, who was of Scotch-Irish ancestry, and emigrated to this country prior to the Revolution and settled in Halifax County, Va.

His classical education was received at Farmington Academy, Missouri. Leaving school, he began the study of medicine with Prof. John P. Harrison of Cincinnati, and graduated M.D. at the Medical College of Ohio in 1846. He began practice in Belmont, Panola County, Miss., but on the declaration of war against Mexico and the raising of troops, he entered the volunteer service as Contract Surgeon May 22, 1847; Acting Assistant Surgeon, and afterwards assigned to duty as Surgeon of the 2d Mississippi Regiment of Volunteers.

He was placed in charge of the hospitals at Buena Vista, where he remained until the close of the war, when he returned with the army. After the disbanding of the forces at New Orleans, he returned to Mississippi and resumed his practice. Dr. Kinchaloe in 1861 entered the Confederate States service as Captain, and served as such until commissioned as a Surgeon in 1862, when he was assigned to duty with the 44th Mississippi Regiment, with which he served six months, when he was promoted to serve as Surgeon of the brigade commanded by Brigadiers Chalmers, Tucker, and Sharp. In 1863 he became Chief Surgeon of Brigadier-General Withers' division, with which he served until the surrender of the Confederate States Army, at which time he was with the forces at Greensboro, N. C. Dr. Kinchaloe was united in marriage November 4, 1851, to Adaline M. A. Bishop, by whom he had a son and daughter. His son studied medicine.

The doctor was a good surgeon, and performed many successful capital operations in the army as well as in private practice. His name appears among those who have operated successfully for ovariotomy. He was a member of the County Medical Society and the Mississippi State Medical Society, also the American Medical Association, having attended that body in 1875. He occasionally contributed papers on medical subjects to the medical journals, and also to the State Medical Society. As surgeon, he made at different times reports both to the United States Army and to the Confederate States Army.

(A sketch of the doctor's life appears in *The Physicians and Surgeons of the United States;* also in the Report on Necrology of the Mississippi State Medical Society for 1879.)

JNO. BROWNRIGG, M.D.

KING, JAMES, M.D., of Pittsburg, Pa., was born in Bedford County, Pa., January 18, 1816; died suddenly at his residence in Bellfield, a suburb of the city of Pittsburg, March 10, 1880. He was the son of John King, one of the prominent iron manufacturers of Bedford County. The doctor was early sent to the Bedford Classical and Mathematical Academy, then under the direction of the Rev. B. R. Hall, where he received a good academical education, and a fair knowledge of the classics. His medical studies were pursued under the eminent surgeon and lithotomist, Benj. W. Dudley, of Lexington, Ky. He at the same time attended lectures at the Transylvania University, at Lexington, in which institution his preceptor was the Professor of Anatomy and Surgery, and graduated M.D. in 1838. Returning to his native State, he began the practice of his profession at Hollidaysburg, Pa. In 1844, he was elected Prof. of Anatomy, Physiology, and Hygiene in the Washington College, at Washington, Pa., which induced him to remove to that place. Here he acquired a good and remunerative professional business. His reputation as a learned physician, and a skilful surgeon, had extended far beyond the geographical boundaries of an ordinary practitioner's labors. In the year 1850, he resigned his chair in the college, and removed to the city of Pittsburg, as affording a larger field for professional labor. Dr. King at this time formed a copartnership with Dr. W. C. Reiter, somewhat his senior, and another of the able physicians of Western Pennsylvania, who I believe is still living. After several years of the most harmonious relations, they separated, and Dr. King and Dr. Coffee became associated in practice, which continued until Dr. King entered the army.

He was no stranger either to the people or the profession, and in a short time was actively employed with a large and responsible practice, which was rarely interrupted for even a day, until the breaking out of the war of the rebellion, when he entered the military service of the United States as a Surgeon. Dr. King served as a Surgeon at Camp Curtin, Division Surgeon of

the State, and Medical Director of the Pennsylvania Reserves up to the battle of Antietam.

After this, at the request of the Governor of Pennsylvania, he was mustered out of the United States service to accept the position of Surgeon-General of the State of Pennsylvania. This trying and responsible office he filled with signal ability until August 1, 1864, when he resigned; his private business requiring his attention, and a large *clientèle* awaiting to welcome him back.

Dr. King now associated with him in practice Dr. F. Lemoyne, an alliance which continued uninterrupted, until it was dissolved about two years since, when the doctor gave up his city office, and removed to his residence at Bellfield, corner of Craig Street and Fifth Avenue.

Dr. King's administration of the Medical Department of the State was characterized by firmness and impartial devotion to duty. He had served as a member of the Board of Examiners appointed by the Surgeon-General, his predecessor in office. Dr. King's reports while Surgeon-General were complete, and showed great familiarity with the details required to make the Medical Department of the army efficient, and to give attention to the condition of troops in health and disease.

He was not only a skilful surgeon, but a man who, in any position, endeavored most conscientiously to discharge, to the best of his abilities, the trust imposed on him.

Dr. King left the army with a record of which any surgeon might be proud. In civil life, too, he was honored for his scholarship and eminent professional qualifications. His stability of purpose and high moral character were known, too, and appreciated by the whole country. From the time he took up his residence in Pittsburg, he was a member of the Allegheny County Medical Society, and was the President of it at the time of his death; a member of the Pennsylvania State Medical Society, and was its President in 1866. He became a member of the American Medical Association in 1866, and has frequently attended its meetings since that time. In 1871, he attended the meeting at San Francisco, and took his daughter Annie and Miss Moorhead with him that they might enjoy the trip to, and obtain a view of the Pacific Coast.

In 1871, Dr. King was elected an honorary member of the California State Medical Society. He was also a member of the

Rocky Mountain Medical Society, composed of all the physicians from the East who crossed the Rocky Mountains to attend the meeting of the American Medical Association at San Francisco.

A sketch of the doctor's life appears in the volume prepared to commemorate the occasion, and those participating. Dr. King was elected to fill many positions of honor and trust in Pittsburg. In 1860, he was made one of the trustees of the Western University, in which position he served faithfully up to his demise.

He was an elder in the Central Presbyterian Church for many years, and wherever he resided, connected himself with the Presbyterian Church. The doctor was an unusually well-informed man, and took a great interest in all public affairs. This was highly appreciated by his acquaintances, who were constantly desirous to elevate him to public and responsible positions, which, however, he did not seek. However, in 1872, he was persuaded to permit his name to go before the public as the Greeley candidate for Congress. He was, however, defeated by J. S. Negley. A firm and long-standing friendship existed between him and Mr. Greeley, and between him and the Hon. James G. Blaine, and many others of the leading statesmen of the country. He was extensively known throughout the State of Pennsylvania, and the whole country. The doctor, although among the busiest of men, took much interest in social and society matters. He was one of the brightest of Masons, and for some years was master of Oakland Lodge, 535.

He was fond of a game of chess, and is said to have been an experienced player. He was a ready and a beautiful writer on almost any subject, and it is to be regretted that he did not contribute more to the literature of our profession. Dr. King was united in marriage to Anne L. Russell, of Bedford, Pa., who survives her husband. They have two children living, both daughters.

The various societies and trusteeships of which the doctor was a member, held meetings and passed appropriate resolutions of respect, and attended his funeral. They all recognized the fact that the doctor was one of their ablest members, and had always been constant and conscientious in the discharge of his duties. Dr. King's funeral took place from the Bellfield Presbyterian Church, the Rev. Mr. Holland officiating, and who delivered an appropriate discourse to a large concourse of people, who then

followed his remains to Allegheny Cemetery, where they were deposited.

J. M. T.

KIRKSCEY, E. J., M.D., was born December 10, 1837, in the State of Arkansas. He died of pelvic abscess, June 1, 1877, at Columbus, Georgia. He graduated M.D. at Jefferson Medical College, Philadelphia, 1858. After obtaining his degree he commenced the practice of his profession at Selma, Ala., where he remained until 1860, when he entered the Confederate army as assistant surgeon. In 1862 he was promoted to the rank of surgeon. In 1868 he again attended medical lectures and took a second degree in medicine at the Atlanta Medical College. He was a great advocate of temperance, and was elected Grand Worthy Chief of the order of "Good Templars" for Georgia. He was also a Mason and an Odd-Fellow.

After the war he entered into practice again, but soon becoming disgusted with hard work, night-watching, and long rides without pay, he accepted the position of general Southern agent for the Piedmont and Arlington Life Insurance Company. In this position he gave entire satisfaction to the company. Notwithstanding his withdrawal from the medical profession, he continued until death an active and faithful member of the Medical Association of Georgia, as well as the American Medical Association, in both of which he felt, as evinced by his actions, a fond and abiding interest.

In 1868 Dr. Kirkscey, with several other citizens of Columbus, Ga., was arrested by military authority, charged with the crime of having assassinated Senator Asburn (Republican) of that city. After many weeks of imprisonment and severe suffering he was arraigned for trial. The main witness for the prosecution was a discharged Union soldier. While the friends of Dr. Kirkscey never for a moment believed him guilty of the heinous offence with which he was charged, the soldier witness professing to have been one of the party who committed the diabolical act, and who had been arrested and imprisoned, and "turned State's evidence," swore so strongly against him as to cause doubts of his innocence in the minds of his best friends. These doubts, however, were soon dispelled by the rigid cross-examination to which this would-be State's witness was subjected, developing the striking fact that he was not only a per-

jured but a hired witness, and Dr. Kirkscey was honorably acquitted. This was the most interesting and exciting trial that occurred in the South during the fearful Ku-klux excitement, and showed very plainly what means might be used to convict innocent persons of complicity with an organization which was condemned by every respectable citizen of Georgia.

T. S. HOPKINS, M.D.

Lute, Albert E., M.D., was born July 1, 1802, at Stamford, Dutchess County, N. Y.; died of pleuro-pneumonia at his home in Romeo, Mich., February 24, 1878, aged nearly 76 years.

He was a lineal descendant of Wm. Lute, who was sent by the English in 1639 as Governor of the Colony of New Haven, and subsequently, in 1665, when the Colonies of New Haven and Connecticut were consolidated under the name of Connecticut, he was made its Governor, which office he held to the time of his death in 1683.

Dr. Lute's mother belonged to one of the old and reputable Puritan families of Connecticut. The doctor's early life was spent at home upon the farm where he was born, and he acquired a good common school education under the rigid discipline of those early days. In the summer of 1824 he commenced the study of medicine in the office of Dr. Shepherd, of Cairo, N. Y., and shortly after pursued his studies with Dr. A. Clark, near the city of Troy, for the purpose of availing himself of the opportunity of observing disease and its treatment at the Rensselaer County Almshouse, then under the medical supervision of his preceptor. In 1825 he attended medical lectures at the Castleton Medical College, Vt. On leaving Castleton he pursued his studies in the office of Dr. Alden March, of Albany, for the term of fifteen months. He attended his second course of medical lectures at the Western College of Physicians and Surgeons, New York, and graduated there at the end of that term in 1826.

From 1826 to 1835 Dr. Lute was in successful practice of medicine at Plainville and Wawarsing, N. Y. He then moved to Lapeer County, Mich., and practised his profession for a few years, removing to Romeo in 1840, where he continued to reside till the time of his death.

Dr. Lute was highly esteemed by his medical brethren, and owing to his superior skill, quick perceptions, and sound judgment, his counsel was largely sought by them. Animated with

a good heart and kindly impulses, his sympathetic attentions and encouraging words to his patients were to them like a flood of light and joy cast upon their gloomy forebodings.

Dr. Lute was ever loyal to the honor and purity of his profession, holding quackery in just contempt.

Dr. Lute was elected member of the Michigan State Medical Society at its organization in 1866, and in 1877 was, owing to his long and honorable career in the profession, made honorary member of said society by a unanimous vote. He was a member, and was repeatedly made President of the N. E. District Medical Society of Michigan. He was also a member of the St. Clair, Sanilac, and Lapeer Medical Association, and was up to the time of his death one of the most interested members of these societies.

Dr. Lute was deeply interested in educational matters, and as President of the Romeo Board of Education rendered much valuable service.

At about the age of 29 years Dr. Lute married Miss Catherine Palen, of Plainville, N. Y. Four sons and three daughters were the fruit of this marriage. One son died at the age of two and a half years, and another died in 1864 while in military service. Mrs. Lute and five children survive to mourn his loss. During the painful illness which proved fatal at the end of ten days, Dr. Lute was attended by his friend, Dr. Tillison, who watched, cared for, and sympathized with him to the last, receiving the countenance, presence, and sympathy of all the physicians of the place. Respected by all who knew him, esteemed by his intimate friends, and beloved by many whom he had cheered in times of bodily affliction, as well as by his own family, relying upon "the promises," he calmly closed his eyes in death, certain of a blessed immortality.

It will be a source of consolation to his many friends in the profession in Michigan and other States, to know that he breathed his last among warm friends and received every attention affection could suggest to smooth the pathway to the grave.

GEORGE E. RANNEY, M.D.

Lewis, R. S., M.D., of Dubuque, Iowa, was born in Northfield, Mass., August 30, 1810; died in Dubuque, Iowa, September 9, 1869. He received his degree of M.D. in regular course at the Geneva Medical College, New York, in 1840.

H. B. RANSOM, M.D.

LILLY, SAMUEL, M.D., was born the fifteenth day of October, A. D. 1815, in Geneva, Ontario County, New York; died at his residence in the city of Lambertville, Hunterdon County, New Jersey, at noon of the third of April, A. D. 1880.

He was the son of William Lilly, of Geneva, Ontario County, New York, who was the son of Samuel Lilly, who was the emigrant ancestor from England of the American branch of the family, being a barrister while in England.

In 1829 Samuel came to his uncle, Dr. John Lilly, of Lambertville, and became the pupil of the Rev. P. O. Studdiford and of his uncle, Dr. John Lilly, with whom he studied medicine, and attended the medical lectures of the University of Pennsylvania, graduating therefrom in the spring of 1837. Thesis, "Abortion."

He commenced practice immediately after his graduation, with his uncle, with whom he continued until his uncle's death in 1848. In 1847, May 3d, he was admitted a member of the District Medical Society of Hunterdon County, becoming its President May 4, 1852, and again April 15, 1869, and in this time becoming a member of the Medical Society of New Jersey, and its President in 1853, at which time he was a member of Congress.

As a practitioner he preferred surgery, and was a good and safe operator, not using the knife for mere display, but using it or not as in his judgment the best interests of his patient required.

Dr. Lilly wrote an essay on epidemic cholera, which he read before the District Medical Society of Hunterdon County October 28, 1851; another on the diseases of India and their treatment, read May 12, 1863; a supplemental paper on cholera continued from 1851, read May 8, 1866. His other writings, consisting principally of valuable reports to societies, resolutions, etc., will be found in the published minutes of said societies respectively.

In 1852 he was elected by the Democratic party to the 33d Congress of the United States; he served his term with marked ability. He was mainly instrumental in getting the city charter for Lambertville, and was its first mayor, elected in 1849 and re-elected in 1850 and 1851. He was for a long time a member of the board of chosen freeholders for the county of Hunterdon, eight of which years he was the director of the

board, and very active in the introduction of iron bridges into the county.

In 1866 he was delegated by the Medical Society of New Jersey to the American Medical Association, which met in Baltimore, since which time he was one of the most attentive members of that illustrious body, serving in different capacities, among which was that of judicial councillor, and in 1877 second Vice-President of the same.

In January, 1861, he was sent as Consul-General to British India by President Buchanan, owing to the death of Dr. Huffnagal, the previous consul.

In 1868 he was appointed Judge of the Common Pleas for the county of Hunterdon, and served five years.

In 1871 he was appointed one of the commissioners to locate and build the new State Lunatic Asylum; he, with his coadjutors, accomplished the task, and caused to be erected for the State of New Jersey one of the most complete, convenient, and safe structures for that purpose to be found in the Union. At the time of his decease he was an active member and secretary to the board of managers of that institution.

In 1873 Governor Parker appointed him one of the judges of the Court of Errors and Appeals, and he was since reappointed by Governor McClellan.

From the organization of the Flemington Railroad he has been a director. He was President of the Centre Bridge Company many years, terminating in October last.

At his decease he was the President of the Amwell National Bank at Lambertville and of the Water Company, and a director of the Lambertville Gas Company, and one of the standing committee of the Medical Society of New Jersey, and likewise a member of the Judicial Council of the American Medical Association.

At one time he joined a military company, and became its Lieutenant, Captain, and, after the death of Gen. Adam C. Davis, Brigadier-General of the Hunterdon County Militia. He assisted in organizing the Odd-Fellows in Lambertville, and also the Masonic Lodge, and to his financial ability that city is indebted for the two substantial buildings belonging to these organizations that now ornament it.

Dr. Lilly was a man of good and temperate habits. He was about five feet nine inches in height, with frank, open counte-

nance, and weighing nearly two hundred pounds; of refined and literary tastes, sociable, affable. In religion his preference was for the Episcopal, being a member of that church. He was kind, generous, and humane, despising trickery, fraud, and duplicity.

He was most of the time healthy; occasionally drooping a little, which he evidently took pains to conceal from his family and friends, not wishing to create anxiety in them in regard to him.

On the 7th of March, 1880, being on horseback, his horse fell with him and partially on him, producing a severe contusion on and in the neighborhood of the left shoulder; on examination of which it was found that the clavicle was fractured one-third the way from the acromion end, which, being attended to and dressed, showed no uncommon or unaccountable symptoms; he felt comfortable so far as that was concerned.

But the shock to the system was fearfully prostrating, frequent spells of long-continued syncope, alternating with spells of most excruciating pain, with intervals comparatively free from pain, continuing, gradually growing longer, until the third of April, when, all, even himself, thought him better, he was attacked with another spell, to which he succumbed. Autopsy showed the valves of the heart in very bad condition, and not capable of performing the necessary action to sustain, and recuperate, and repair the system.

Resolutions passed by the District Medical Society of the County of Hunterdon, N. J., at its annual meeting in Flemington, this 27th of April, 1880:—

1. *Resolved*, That in the removal from our midst to a higher sphere of action, of our beloved Dr. Samuel Lilly, we recognize the hand and bow submissively to the will of a kind and beneficent Creator, one that does all things well, "For he doth not afflict willingly nor grieve the children of men."

2. *Resolved*, That not only this society but the whole medical profession have lost an honored colaborer, the community a kind, skilful, learned, honest, sympathizing physician and friend.

3. *Resolved*, That we tender to his family in this the sad hour of their affliction and grief our heartfelt sympathy. "Let us not mourn for him as for one without hope."

4. *Resolved*, That by his kind manners, his genial deportment, his earnestness for the good of the profession, he has endeared himself to us all. We cherish his memory and good works, and individually vie with each other in emulating his virtues and example, carrying them out both to our brethren in the profession and those who trust themselves to us as patients.

He was buried in Mount Hope Cemetery, Lambertville. Funeral service at the house, by the Rev. Dr. Putnam, Episcopal minister for Jersey City, when the remains were conveyed to the cemetery and buried with Masonic honors.

In 1839 he married Miss Mary Ann Titus, of Mercer County. She died, and there is no issue left living of that union.

In 1850 he married Mrs. Mary Ellen Torbert, daughter of the late Lewis Coryell, Esq., of New Hope, Pa. She died August 4, 1867, leaving one daughter, Miss Mary Frances Torbert, by her first husband, and one son, John Lilly, Esq., by her last marriage; they with himself constituting his family since the death of his wife—the son practising law in his native city.

JOHN BLANE, M.D.

McGuire, Hugh Holmes, M.D., of Winchester, Virginia, was born at the Grove, in Frederick County, Va., November 6, 1801; died in 1875. He studied medicine with Dr. Robert Barton, a learned physician of Winchester. He attended lectures and graduated M.D. at the University of Pennsylvania in 1822. His thesis was on "Tetanus." Immediately after taking his degree he returned to Virginia and opened an office in the town of Winchester. He left college with a preference for surgery, which he retained and successfully practised throughout all his professional life.

The first surgical operation he performed was that for cataract by couching, which he did with a needle made by a machinist in Winchester, under his direction. In 1827 Dr. McGuire and Dr. John Easton Cook founded the medical school at Winchester, in which the first-named gentleman filled the chair of Anatomy and Surgery. In 1847 this institution was chartered under the name of "The Winchester Medical College," and the faculty organized, Dr. McGuire filling the chair of Surgery. The college continued to prosper until the outbreak of the war between the States. A fine college building had been erected and furnished with all the appliances for successful teaching. In 1862 the building was burned by the troops under General Banks. Dr. McGuire was commissioned Surgeon in the Confederate States army and served until the close of the war. He was at one time in charge of the hospital at Greenwood Depot, and afterwards at Lexington. Dr. McGuire's college furnished professors to quite a number of medical schools; and he was fre-

quently urged to accept chairs of surgery in other schools, in Philadelphia, New Orleans, and other cities, which he declined, being greatly attached to the people of Virginia and his own institution. In 1849–50 he was elected one of the Vice-Presidents of the American Medical Association.

As a lecturer on surgery, the doctor's style was forcible and his manner earnest. His mind was stored with facts, and his power to convey knowledge and principles to his pupils very remarkable. His practice, particularly in surgery, was always large, patients coming to him from all points of the State. As an evidence of his skill and success in surgery, I may remark that he operated for stone thirty times without losing a case. He possessed all the elements of a successful surgeon, exact anatomical knowledge, exact in diagnosis, courage, precision, and perseverance, and had he lived in a great city would have been one of the first surgeons of the country. Although the medical college he created has been discontinued, his name and fame as a surgeon will be as enduring as the valley in which he labored so successfully, and so much to the honor of his profession.

J. M. T.

MAGRUDER, HEZEKIAH, M.D., was born in Georgetown, D. C., May 25, 1804; died at his residence in that city July 20, 1874. He was the youngest of several children of George B. Magruder and Charity Margaret Wilson, all occupying high social position. He was educated at the classical seminary of the Rev. James Carnahan, then extensively patronized and in very high repute.

He studied medicine in the office of Dr. Benjamin S. Bohrer, and after graduating at the University of Maryland in April, 1826, he commenced the practice of his profession in his native town, being there actively engaged until the time of his death. Dr. Magruder was a member of the Medical Society of the District of Columbia, and also a member of the Medical Association, District of Columbia. In 1858, when the American Medical Association met in Washington, the doctor was sent as a delegate from the Medical Society of the District. Dr. Magruder was three times married. His first wife was Miss Alice Crittenden of Georgetown, of which marriage there is one daughter living; his second wife was Miss Mary Chipman of Georgetown, who died in a few months leaving no issue. His third wife was

Miss Mary E. Fitzhugh of Virginia; of this marriage there are living a daughter and two sons; one of the latter, Alexander F. Magruder, M.D., is a passed Assistant Surgeon in the U. S. Navy.

Dr. Magruder maintained always the reputation of an excellent citizen and skilful physician, and died respected and beloved by all who knew him, and most sincerely lamented by many who had received the benefits of his skilful and generous offices. He was buried in Oak Hill Cemetery.

GRAFTON TYLER, M.D.

MARBURY, WILLIAM, M.D., was born in Georgetown, D. C., Feb. 9, 1824; died at his residence, of disease of the heart, Dec. 18, 1879. He was the son of John Marbury, an eminent lawyer of the District. The subject of this sketch received his collegiate education at the University of Georgetown, where he graduated in 1843. Shortly after this he began the study of medicine in Georgetown, with Dr. Grafton Tyler, one of the leading physicians of the District of Columbia. He attended lectures at the University of Pennsylvania, where he graduated M.D. in 1847. His thesis upon the occasion of receiving his degree was upon "Pneumonia."

Dr. Marbury began to practise his profession at Falmouth, Stafford County, Va., where he acquired a fair business, but after about four years returned to the District and opened an office in Washington City. Here he acquired a good remunerative practice, and held it with increasing reputation until he withdrew from its duties to attend to his investments in the oil business in West Virginia, which proved to be profitable and required his personal supervision.

Dr. Marbury always took an active interest in medical organizations. In 1861 he was elected treasurer of the Medical Society of the District, and served the society faithfully through the most trying period of its existence, and during which an effort was made by the society to build a hall. The doctor was indefatigable not only in the discharge of his duty as treasurer, but in his zeal as a member, for the success of the project. The enterprise failed in the end, but from no fault of his. He had a good business judgment, and was a man of firm and just integrity, whose word was as good as a bond in every relation of life. With physicians he was the very prince of ethical deportment and observance.

Dr. Marbury was for many years the physician to the Washington Protestant Orphan Asylum, and for some years was on the staff of the physicians attending Providence Hospital. He was always solicitous for his patients, and studied their condition, and the effects of remedies upon them, with the greatest possible care, and was an extensive reader of the best books.

He was a member of the Medical Association of the District, and also a member of the American Medical Association since 1865.

The doctor was not married; his two sisters kept house for him, and were with him constantly during his protracted illness. The Medical Society of the District held a special meeting on the announcement of Dr. Marbury's death, and passed appropriate resolutions of respect for his memory, and attended his funeral in a body.

J. M. T.

MEARS, GEORGE WASHINGTON, M.D., was born at Harrisburg, Pa., June 27, 1803, and died at Indianapolis, Ind., May 20, 1879. He was of English descent. His great-grandfather came to this country from Everton, England, with General Oglethorpe's expedition, and settled in Georgia. His race has been distinguished for energy, enterprise, and courage. His parents were among the first settlers at Catawissa, on the banks of the Susquehanna. There he attended the common schools, and also received instruction from private tutors. He was taught a knowledge of the classics by the celebrated teacher, Ellis Hughs. He commenced his medical education under the direction of his brother-in-law, Dr. E. Daniels, a well-educated physician of Massachusetts. In the winter of 1824 and 1825 he attended his first course of lectures at the Medical Department of Yale College. His second course was at Philadelphia, in the winter of 1825 and 1826, as a member of the first class of the Jefferson Medical College, as the college was just then organized. He attended a second course in this college, and graduated in the spring of 1827. A number of his classmates have since become distinguished either as writers, teachers, or practitioners. While a student, he was elected Resident Physician of the Children's Asylum, corner of Fifth and Plum Street, Southwark. At this establishment there were over two hundred children, all under six years of age. The institution was attended by eminent

physicians, such as Condie, Nancrede, Coates, and others of equal ability; consequently, the clinical advantages to him were of great value. At the expiration of his term in the asylum, he opened an office on Vine Street below Third, where he practised for two years. In 1829, he removed to Washington County, Ind., where he remained until the winter of 1832, when he removed to Vincennes. At this place, on the 23d of November, 1833, he married Miss Caroline Sidney Ewing, daughter of Nathaniel Ewing, of Indiana.

In 1834, he removed to Indianapolis, where he was engaged in professional duties for upwards of forty-five years. He always took a deep interest in everything calculated to advance the medical profession. In 1848, he assisted in the organization of the Medical Department of the Asbury University, and accepted the chair of Obstetrics, which he occupied during the three years the school was in existence.

In 1849, he took an active part in organizing the Indiana State Medical Society, and in 1851, he was elected its President. In 1852, he delivered an admirable address as President of the society, and has always been an active member, at times contributing valuable papers, which may be found in the Transactions of the society. He was a Delegate from the society to the International Medical Congress which met in Philadelphia in 1876.

He assisted in organizing the Indiana Medical College, and was one of its professors, until it merged into the Butler University. He was Emeritus Professor of Obstetrics and Dean of the Faculty in this last institution, at the time of his death. He was one of the founders of the Christ Episcopal Church at Indianapolis—always a prominent and consistent member—acting at times as vestryman or warden. He was a member of the first board of trustees of the Blind Asylum, and always felt a deep interest in the institutions of Indiana. He was one of the board of medical examiners for pensions at the time of his death. He was a member of the Marion County Medical Society, the Indiana State Medical Society, the American Medical Association, an honorary member of the California State Medical Society, and a member of the Rocky Mountain Medical Society, and, in 1875, acted as its President.

He was a diligent student up to the time of his last illness, and kept himself familiar with the literature of his profession. He was noted for the sincerity and endurance of his friendship;

his hospitality; his dignity, urbanity, and gentlemanly deportment; his ready sympathy with the distressed; his delicate consideration for his juniors; his tender devotion to his family; the purity of his life, and those admirable qualities of mind and character which contributed to make him what he was—a true friend, a Christian physician, and a model husband and father.

G. SUTTON, M.D.

MEIGS, JAMES AITKEN, M.D., Professor of Physiology and the Institutes of Medicine in the Jefferson Medical College, died at his residence in Philadelphia on November 9, 1879, in the 51st year of his age. He had been ill with what appeared to be a severe malarial attack for a few days, but his death was preceded by evidences of blood-poisoning. No post-mortem examination was permitted; the immediate cause of death must, therefore, remain a subject for conjecture; heart-clot, portal phlebitis, and discharge of hepatic abscess into the vena cava having each been suggested.

Prof. Meigs was born in Philadelphia, in 1829, of English and Scotch ancestry. He graduated in Jefferson Medical College in March, 1851. He then began practice in Philadelphia, where he since pursued it until his death. For several years he acted as assistant to the Professor of Physiology in the Pennsylvania College, and engaged in the examination and preparation of students for examination. In September, 1854, he was appointed Professor of Climatology and Physiology at the Franklin Institute, holding the position for eight years, during which time he also lectured frequently on physiological and ethnological subjects at the different mechanics' institutes in Philadelphia, and before various literary associations in neighboring cities.

In 1857 he accepted the chair of Institutes of Medicine in the Philadelphia College of Medicine, and occupied it until April, 1859, when he was transferred to the professorship of Institutes in the Medical Department of the Pennsylvania College, previously held by Prof. F. G. Smith, for whom the chair was originally created by the trustees of the parent institution at Gettysburg. In November, 1859, while still connected with the Pennsylvania College, he was elected Consulting Physician and Clinical Lecturer to the Philadelphia Hospital. On the breaking out of the civil war in 1861 he, in company with his colleagues, resigned from the Pennsylvania College. In June,

1868, he was elected by the board of trustees of Jefferson Medical College Professor of Institutes of Medicine and Medical Jurisprudence. In August of the same year the board of managers of the Pennsylvania Hospital chose him, without the usual canvass, one of the physicians of that institution. These two positions he held until his death.

He was a member of the Philadelphia County Medical Society, of which he was elected Recording Secretary in 1857, and a year later Corresponding Secretary, to which office he was twice re-elected, becoming in 1867, moreover, one of the Vice-Presidents, and in 1871 the President.

Dr. Meigs was a trustee of the Polytechnic College, and of the Pennsylvania College of Dental Surgery, a member of the State and County Medical Societies, of the American Medical Association, of the American Association of Science, of the Franklin Institute, of the Academy of Natural Sciences of Philadelphia, of the Historical Society of Wisconsin, of the Medico-Legal Society of New York, of the Antiquarian Society of Philadelphia, of the New York Lyceum of Natural History, of the Société d'Anthropologie de Paris, the Ethnological Society of London, the Societas Medicorum Svecanae of Stockholm, and the International Congress of Prehistoric Archæology.

While a student of medicine, and for some time after his graduation, Prof. Meigs contributed to the *Medical Examiner* clinical reports of cases treated at the Jefferson College and the Pennsylvania Hospital, the discussions of the Philadelphia County Society, and papers on the mortuary statistics of Philadelphia. He wrote and published many articles of merit, among them being one on the physiology of stammering and its treatment by mechanical means. In 1856 he prepared an appendix to the first American edition of Carpenter's work on the microscope. The following year, being chairman of the Standing Committee on Arthropology, he arranged and classified the extensive collection of human crania in the Academy of Natural Sciences, and prepared a systematic catalogue of the collection, which was published by the Academy.

He also contributed, during 1857, to Nott and Gliddon's *Indigenous Races of the Earth*, an essay on the cranial characteristics of the races of men, presenting a general survey of human skulls in their ethnical relation; and also edited an American edition of Kirke's *Manual of Physiology*. To the Pro-

ceedings of the Academy of Natural Sciences, the Reports of the Smithsonian Institution, and other like publications, he contributed at various times many original and interesting articles on craniology. He likewise contributed numerous reviews on a great variety of physiological, medical, and scientific subjects to the *Medical Examiner*, the *North American Medico-Chirurgical Review*, and the *American Journal of the Medical Sciences*, and prepared for Prof. Gross's *American Medical Biography* the memoir of Dr. Randolph.

At the college commencement in 1879 Prof. Meigs delivered the valedictory address to the graduating class of the Jefferson College. It was in the form of an epic poem, celebrating the nuptials of the Young Physician and Fair Hygeia.

While librarian to the Academy of Natural Sciences, Dr. Meigs distinguished himself by his zeal and great industry in ethnological studies, especially in regard to the cranial characteristics of different races, in which field he appears to have made his chief, original, and permanent contributions to science. The papers which he then published attracted the attention of foreign observers, and established his continental reputation and gave him honorary membership in a number of foreign societies. In his lectures at the Pennsylvania College he repeated and amplified all of Brown-Séquard's physiological experiments and many of those of Bernard, whom he greatly admired and held in great esteem. Since that time he had abandoned vivisection, preferring to illustrate his lectures by means of the camera and diagrams.

In the lecture-room Prof. Meigs appeared to his best advantage. Deeply interested in his subject himself, he spared no pains to make his lectures instructive and attractive to his students by careful preparation and abundant illustration. His use of the stereopticon as a means of explaining his subject was extremely fortunate. His lectures, delivered a year ago, upon the eye and ear, will long be remembered by those who heard them, for their faithful representation of the latest contributions to the anatomy and physiology of these organs; they probably have never been excelled in this country. Last winter he began his lectures with the subject of "Reproduction," and it gave promise of being an unusually brilliant course. When lecturing he was nervous and animated; he made no effort at oratorical display, but kept ever before him the idea simply of communi-

cating information; his style was, therefore, plain and unpretending, though not unpolished; he possessed a free flow of language, but was cautious in expressing his views upon facts which he considered not fully established. Always affable and sympathetic in his manner, naturally kind and obliging in his disposition, ever ready to answer questions and freely communicate the results of his laborious studies, he was not only regarded as a friend by the students, but possessed the confidence and regard of his colleagues, and the profession and community at large.

In his thirty years' practice he was very successful, having devoted himself to it very closely; indeed, for a number of years he scarcely permitted himself any relaxation whatever. At one time he attended nearly two hundred and sixty obstetrical cases in the course of twelve months. The cause of science has suffered from these engrossing cares, which he never could be prevailed upon to resign. His bodily health, like his mind, was unusually vigorous, but it yielded at last with such suddenness as to make it evident that his constitution had been undermined by nights devoted to study and days consumed by constant toil.

The resolutions adopted by various societies upon the announcement of the death of Prof. Meigs attest the high appreciation in which he was universally held as a man of science, as a successful teacher, and as a cherished friend.

We subjoin an approximately complete list of his contributions to medicine and science:—

1. Report of a Case of Epilepsy from Pressure upon the Brain. Medical Examiner, Nov. 1848, p. 648.
2. Report of a discussion upon the Causes of the greater Mortality of Male Children, and the influence operating to change the relative proportion of the sexes at birth. Medical Examiner for March, 1850, p. 147.
3. On the Mortality in Philadelphia. Medical Examiner for April, p. 249; May, p. 317; July, p. 427; August, p. 488; Sept. p. 545; Oct. p. 617; and Nov. p. 665.
4. Clinical Reports of Cases in Pennsylvania Hospital. Medical Examiner for February, 1851, p. 109.
5. On Anæsthesia. Medical Examiner for April and May, 1852, pp. 243 *et seq.*, and p. 298 *et seq.*
6. Reports of Clinical Cases. Medical Examiner for May, June, July, and Sept. 1852, pp. 322, 383, 430, and 586.
7. Semi-annual address delivered at Concert Hall before the Alumni Association of the Central High School in July, 1854.
8. On the Physiology of the Voice, with remarks upon Instruments for the

cure of Stammering. Journal of the Franklin Institute for April, 1854. Republished subsequently in an English journal called "Braithwaite's Retrospect."

9. Review of Prof. G. S. Bedford's Clinical Lectures on the Diseases of Women and Children. Medical Examiner for Sept. 1855.

10. An Essay on the Relation of Atomic Heat to Crystalline Form. Read before the Academy of Natural Sciences of Philadelphia, July, 1855. Published in the Journal of the Academy, vol. iii., Part II.

11. On Organic Diseases and Functional Disorders of the Stomach. Medical Examiner, March, 1856.

12. Digestion and its Derangements. Medical Examiner for Nov. 1856, p. 671.

13. Appendix to the 1st American edition of Carpenter's work on the Microscope and its Relations. Phila., 1856.

14. Catalogue of Human Crania in the collection of the Academy of Natural Sciences of Philadelphia. Phila., 1857.

15. The Cranial Characteristics of the Races of Men, contributed to Nott and Gliddon's Indigenous Races of the Earth. Phila., 1857.

16. In 1857, he edited "Kirke's Manual of Physiology," a standard English work on physiology.

17. Review of "Holland's Notes and Reflections." North American Medico-Chirurgical Review for May, 1857, p. 368.

18. An article on the "Races of Men." North American Med.-Chirurgical Review. Sept. 1857.

19. A Physiological Review. Same Journal, same No., p. 704.

20. A review of "Peaslee's Histology." North American Med.-Chirurg. Review, March, 1858, p. 260.

21. Remarks on the Correlation of the Physical and Vital Forces. Same Journal for Sept. 1858, p. 807.

22. A review of Brown-Séquard's "Journal de la Physiologie." Am. Jour. Med. Sciences, Oct. 1858, p. 505.

23. Hints to Craniographers upon the Importance and Feasibility of Establishing some Uniform System by which the Collection and Promulgation of Craniological Statistics and the exchange of Duplicate Crania may be promoted. Proceedings of the Acad. Nat. Sciences for Aug. 1858.

24. On Uræmic Convulsions. North American Med.-Chirurgical Review, Nov. 1858, p. 1120.

25. On Craniography. Same Journal, same No., p. 1148.

26. On Epilepsy, and other Convulsive Affections. Same Journal, January, 1859, p. 34.

27. Clinical Lecture delivered in Philadelphia College of Medicine. Reported in Butler's Med. and Surg. Reporter.

28. On the Successful Treatment of Scarlet Fever, together with Observations on the Pathology and Treatment of Crowing Inspiration in Infants. North Am. Med.-Chirurg. Review, March, 1859, p. 230.

29. Valedictory Address to the Graduating Class of Philadelphia College of Medicine at the Annual Commencement held March 2, 1859.

30. Remarks on the Methods of Studying and Teaching Physiology. North Amer. Med.-Chirurg. Review for July, 1859.

31. Review of Dr. Green's work on Bronchitis. Same Journal, same No., p. 729.

32. On Diseases of the Blood. Am. Journ. Med. Sciences, Oct. 1859.

33. Description of a deformed Fragmentary Human Skull found in an ancient quarry-cave at Jerusalem, with an attempt to determine by its configuration alone the ethnical type to which it belongs. Read before the Acad. Nat. Sciences, Sept. 20, and published in their Proceedings for Sept. 1859.

34. On Diseases of the Stomach. North Am. Med.-Chir. Review for Nov. 1859.

35. A Review of Flouren's work on the Discovery of the Circulation of the Blood. Amer. Journ. Med. Sciences for January, 1860.

36. Forensic View of Man and Law. Same Journal for July, 1860.

37. On the Organs of Vision North Am. Med.-Chir. Review for Sept. 1860.

38. On the Circulation in the Head and Extremities of Man. Same Journal, same No.

39. On Electro-Physiology and Therapeutics. Am. Journ. Med. Sciences for October, 1860.

40. On the Circulation of the Blood. Same Journal, same No.

41. Memoir of Dr. Jacob Randolph, contributed to Prof. Gross's American Medical Biography.

42. Review of Dr. Metcalfe's work on Caloric. North Amer. Med.-Chir. Review for Nov. 1860.

43. Observations on the Form of the Occiput in the various Races of Men. Read before the Acad. of Nat. Sciences, and published in their Proceedings for 1860.

44. Researches on the Gray Substance of the Spinal Cord. Am. Journ. Med. Sciences for April, 1861.

45. Review of Philips' Cours Théorique et Pratique de Baidisme, etc. Am. Journ. Med. Sciences for April, 1861.

46. Bibliographical Notice of Mitchell's Monograph on Rattlesnake Poisoning, etc. Am. Journ. Med. Sciences for July, 1861.

47. On the Mensuration of the Human Skull. North Amer. Med.-Chir. Review for Sept. 1861.

48. On Food and its Digestion. Am. Journ. Med. Sciences, January, 1862.

49. On Imperfect Digestion. Same Journal, same No.

50. Theories of Life and Organization. Same Journal for July, 1862, p. 119.

51. On the Diagnosis and Treatment of the principal forms of Paralysis of the Lower Extremities.

52. Health and Disease as influenced by the daily, seasonal, and other cyclical changes in the Human System. Same Journal, Oct. 1862.

53. Practical uses of the Laryngoscope; Thrombosis of the Cerebral Sinuses; Atrophy of the Brain; Application of Statistics to Medical Injuries; Uses of Cold in Surgical Practice. Same Journal, January, 1863.

54. On the Characters of Inorganic and Organic Matter. Same Journal, July, 1863.

55. Origin, Antiquity, and Zoological Relations of Man. Same Journal, Oct. 1863.

56. Outline of a New Theory of Muscular Action. Same Journal, Oct. 1863.

57. Histology of the Spinal Cord. Same Journal, 1864.

58. Gray Substance of the Medulla Oblongata and Trapezium. Same Journal, July, 1864.

59. Remarks upon the Arrangement of the Muscular Fibres of the Heart; and the relation, structure and function of the valves of the vascular system in the vertebrata. Same Journal, 1866.

60. Review of Flint's Physiology of Man. Same Journal, July, 1866, and January, 1868.

61. Reflex Paralysis; its Pathological Anatomy and Relation to the Sympathetic Nervous System. Same Journal, Oct. 1866.

62. Observations upon the Cranial Forms of the American Aborigines, based upon specimens contained in the collection of the Acad. of Nat. Sciences of Philadelphia. Read before the Academy, and published in its Proceedings for May, 1866.

63. Ovarian Physiology and Pathology. Am. Journ. Med. Sciences for April, 1867.

FRANK WOODBURY, M.D.

MEISEL, HARRY, M.D., was born January 9, 1824, in Dresden, then the capital of the kingdom of Saxony. His father was one of the magistrates of the city, and a member of the Diet of Saxony; died at his residence in Elmira, New York, September, 1872.

His early education from his sixth to his fourteenth year was received from a "hoffmeister" or house-teacher. In his fourteenth year he entered the gymnasium at Dresden, from which he graduated in his twentieth year. He then entered the University at Leipsic as a student of medicine, from which he received his degree in 1850, after a course of five years.

He settled in Posseone, Saxony, for one year, where cholera was then prevailing. He then returned to Dresden, and became assistant to Dr. Hedenus, and later to Dr. Walther, at which time also he became physician to the city hospital for children.

In 1853 he embarked at Bremen for America, landing in New York. For one year he engaged in other pursuits in New York, then settled in Susquehanna, New York, where he soon gained an extensive practice. He removed to Elmira in 1860, and soon gained a lucrative practice, chiefly among the foreign population. He was a member of Chemung County Medical Society and Elmira Academy of Medicine. In 1870 he was elected a member of the American Medical Association.

C. W. BROWN, M.D.

MILLER, ALFRED, M.D., was born at Westminster, Vermont, in 1815; died at his residence November, 1877.

He was fitted for college at the high schools, and graduated at Middlebury, Vermont, in 1840. While teaching at Ashby he pursued his medical studies with the late Dr. Hitchcock. He was graduated in medicine in 1844 at the medical school at

Woodstock, Vermont, and commenced the practice of his profession at Ashburnham in 1845. In 1847 he was married to Miss Elsie Kibling, of Ashburham. During his residence of sixteen years in Ashburnham he held many positions of trust, and served fifteen years on the school committee. In May, 1862, he removed to Fitchburg, and continued in the uninterrupted practice of his profession until his death. In 1862 he received the appointment of coroner for Worcester County, and served in that capacity until 1877. He was twice elected a member of the legislature, first in 1866 and again in 1876.

He was a life-long friend of the late Dr. Hitchcock, who was also a native of Westminster, and the intimacy formed in boyhood continued unbroken until the death of the latter in 1874. Dr. Miller was a man of excellent judgment, and his opinions, whether on subjects connected with his profession or outside, were sound and well grounded. He was large hearted and hospitable, a decided and consistent Christian. He was devoted entirely to the honest and conscientious performance of his humane calling. In his professional duties he often sacrificed his own comfort to the good of his patient, and during the latter years of his life, though those duties were at times burdensome, they were cheerfully discharged.

He died of bronchial pneumonia after an illness of about two weeks.

Data from the Fitchburg *Sentinel*.

L. F. WARNER, M.D.

MILLER, GEORGE RICHARDS, M.D., of Washington, D. C., was born in the city of Washington, January 10, 1846; died at the residence of his father, in Washington, June 5, 1872. He was the son of Dr. Thomas Miller, long one of the leading physicians of the capital. His mother was Virginia C., daughter of Walter Jones, Esq. The subject of this sketch received a good collegiate education, and selecting medicine as a profession, commenced the study of it in 1865, under the supervision of his father. He attended one course of lectures at the National Medical College, and the following year, a course at Bellevue Medical College, New York City. The winter following he matriculated at the University of Pennsylvania, where he graduated M.D. in 1868. Returning to his native city, and determining to rely upon himself, he opened an office on Fourteenth

Street, and soon acquired a fair amount of business. He was unremitting in his attention to his professional duties, but unmindful of himself. His zeal for business and solicitude for his patients, with loss of rest and a neglected cold, began to seriously impair his health; but he worked on, hoping to recover, and at the same time attend to his practice. After struggling to do this, he was at length forced to suspend professional business for a time, and, as he hoped, soon to return to it again, he retired to his father's farm, near Leesburg, in Loudoun County, Va. Here he was taken, almost instantly on his arrival, with congestion of the lungs, which ended in abscess. Recovering, in a measure, from this, but doubting whether he could resume his practice with safety, and believing that the country agreed with him, he was beginning to assume an active superintendence of the farm, when it became manifest to his friends that tuberculosis was developed, and rapidly destroying his lungs.

In May, 1872, he came to Washington, to visit his father; and, while here, on the 5th of June, he was seized with a sort of dysentery, which probably had a tuberculous origin, which was the immediate cause of his death.

He was a member of the Medical Society and of the Medical Association of the District of Columbia; also, a member of the Clinico-Pathological Society of Washington. These societies held meetings when his death was announced, and passed resolutions expressive of their appreciation of him as a physician and as a citizen, and resolved to attend his funeral in a body. He was a Delegate from the Medical Society of the District of Columbia to the American Medical Association, in 1870. The opinion was general among Dr. Miller's medical acquaintances that, had he enjoyed health and length of days, he would have won distinction in the profession. A memoir of the doctor was made up chiefly from the proceedings and remarks of members of the different medical bodies relative to his death, which was published, which furnished most of the data for this sketch.

J. M. T.

MONROE, ALEXANDER LE BARON, M.D., was born in Sutton, Mass., May 3, 1807; died at his residence February 19, 1879. He was the son of Dr. Stephen and Susannah Le Baron Monroe. Graduated from the Medical Department of Yale College in 1831. In the following year commenced the practice of his

profession in the East Parish of Medway. In 1833, removed to Medway Village, where he continued in practice till 1840, when he removed to Chicopee, Mass. In the winter of 1842–43 he removed to Granby, Mass., where he remained in practice some ten years. In September, 1852, he returned to Medway, in response to an earnest invitation, where he continued in practice till failing health compelled him, in 1877, to retire from professional life. He was absent for a short time in 1862, serving as a Surgeon in the Peninsular campaign, under Gen. McClellan, in the war of the rebellion, having volunteered, in response to a call for extra medical service in an emergency.

Dr. Monroe was twice married; first, to Louise Barber, of Medway, October 2, 1834, who died June 2, 1836, leaving one son, who still survives.[1] His second marriage was to Mrs. Miriam W. Warres, Nov. 30, 1837, by whom he had two children, a son who died in childhood, and a daughter, who, with her mother, survives him. He was enthusiastic in his professional work, a good student, and a close observer. One of his contemporaries said of him, "I esteem Dr. Monroe the best read man, in all literature bearing on his profession, in the local association of which he was a member." He was held in high esteem by the public for his fine abilities as a physician, and was often sought in counsel by his fellow practitioners for his medical judgment and skill.

As a citizen, he was public-spirited, and devoted to whatever tended to the material, social or moral improvement of his community.

The religious aspect of his life and character is worthy of special notice. It is said of him by his pastor that, notwithstanding his busy professional life, he was very rarely absent from public worship, and served as superintendent of the Sabbath school, and as leader of the church choir; and, he adds, "Dr. Monroe's religious experience qualified him to minister to the spiritual needs of his patients, as well as to their physical. There are many households who will never forget his tender offices in this respect."

In the autumn of 1877 he was attacked by disease which seriously affected his mind, and necessitated his giving up all professional labor. He, however, so far recovered as to enjoy the freedom from business cares during the last months of his life,

[1] Dr. F. Le B. Monroe, of Brooklyn, N. Y.

till, at the age of seventy one years and ten months, on the morning of the 19th of February, 1879, he quietly passed away in sleep.

L. F. WARNER, M.D.

MORRISON, JOHN M., M.D., was born near Laurinburg, N. C., May 10, 1836; died at Hearne, Robertson County, Texas, February 17, 1880. He graduated at the University of North Carolina, at Chapel Hill, in 1854, read medicine with Dr. Robert Dixon in Laurinburg, and afterwards attended lectures in the New Orleans School of Medicine, where he graduated in 1858. After graduating he practised his profession in Mississippi for perhaps a year, when, on account of the death of his mother, he relinquished practice and removed to Louisiana, and took charge of a plantation until the beginning of the late war. He entered the Confederate service with the 4th Louisiana Battalion, as Assistant Surgeon, and while stationed at Savannah, Ga., in the spring of 1862, immediately after the eight days' fight around Richmond, was ordered there and assigned to duty as Assistant Surgeon in the hospital located in the Presbyterian University, and while there came near losing his life with typhoid fever. Upon his recovery his attending physician advised him to resign and return home, as he had beyond a doubt organic disease of the heart. He was also examined by the examining surgeon at Richmond, and pronounced unfit for service, when he tendered his resignation, which was accepted, and he returned to his home in Louisiana, and remained there until the spring of 1863, when he refugeed to Texas. He began the practice of medicine in Robertson County, in 1866, and continued it until six days before his death, with the exception of about ten months in 1878, during which year, in the month of June, he had abscess of the liver, and came near dying. The December following he went to San Antonio, and was examined by several eminent physicians and pronounced incurable. During the last seven or eight years of his life his heart troubled him greatly, and he suffered from frequent attacks of rheumatism, and dropsical symptoms, such as swelling of the face, hands and feet.

I know of no work of Dr. Morrison on practice, medical or surgical, except an article on Green or Black Jaundice, contributed to the *Galveston Medical Journal*, in April, 1867, a copy of which I send you herewith.

Dr. Morrison died at his residence, after being confined to his bed for six days, from uræmic poison; the kidneys failed utterly to perform their usual proper function. He suffered greatly, but was unconscious for the last thirty-six hours of his life, and during his illness was attended day and night by Drs. Matkin and Bassett, of Hearne, Drs. Garrett and Faucher, of Calicut, and Dr. Pugh, of Bryan, and was constantly surrounded by friends, male and female, each anxious to do what they could to relieve his suffering.

The death of Dr. Morrison was the greatest calamity that could have befallen this community. He was recognized wherever known as eminent in the practice of medicine and surgery. The doctor was a polished gentleman, a ripe scholar and a warm and faithful friend. He was a Delegate from the Texas Medical Association, in 1874, to the National Association, and while absent was tendered a chair in a popular medical college.

The doctor was married, and leaves a wife and children.

F. H. BAILEY.

Nims, Dwight Boyden, M.D., of Jackson, Michigan, was born at Conway, Franklin County, Massachusetts, Sept. 12, 1808; died at his residence in Jackson, Mich., April 15, 1879, after an illness of five days.

He graduated M.D. at the Berkshire Medical Institute, Mass., in 1823. September 8, 1834, he was united in marriage with Anna A. White, of Moulins, New York, and the year following removed to Michigan, where he acquired a good professional business, and sustained throughout the State the reputation of a skilful physician. Dr. Nims was a warm supporter of medical organizations, and connected himself with them wherever he resided, and became a member of the American Medical Association in 1856, attending its meetings in 1858, '74, and '77.

(For full biography of the doctor see Transactions of the Michigan State Medical Society for 1879.)

J. M. T.

Ordway, John P., M.D., was born in Salem, Mass., April 4, 1824; died at his residence in Boston April 27, 1880. His father removing to Boston became one of the founders of East Boston. Dr. Ordway was educated in the Boston public

schools, and received a Franklin medal in 1837. He early developed a fondness for music, and composed several songs which became quite popular. He organized the once famous group of vocalists known as "Ordway's Æolians." After continuing the study of music for a time he was stimulated by a worthy ambition to turn his attention to medicine. He entered Harvard Medical School, graduated in 1859, and began the practice of his profession in 1860.

He was one of the first surgeons in the field after the war of the rebellion broke out.

During the past ten years he has practised as a specialist. In public affairs Dr. Ordway took a great interest, and has been honored with election to several responsible positions. He was a member of the Legislature in 1868. From 1862 to 1875 he was a member of the school committee, and from 1863 to 1865 a member of the common council. He founded the Massachusetts Anglers' Association, now the Fish and Game Association, and was its President five years. He was at one time Surgeon of the Ancient and Honorable Artillery Company. He belonged to the order of Masons, and had taken its highest degrees.

Dr. Ordway never fully recovered from injuries received from a railroad accident in 1875, but the direct cause of his death was a malignant carbuncle.

Dr. Ordway was a man of social disposition and enjoyed a wide circle of warm friends. He leaves a widow and one daughter.

L. F. WARNER, M.D.

POTTS, THOS. R., M.D., was born in Philadelphia in 1810; died of apoplexy at his residence, St. Paul, Minn., Oct. 6, 1874. After receiving a liberal education he graduated in medicine at the University of Pennsylvania, and immediately commenced the practice of his profession in Mississippi. After a few years he removed north, and in 1850 settled in St. Paul, Minn. In 1856 he was elected President of the Medical Society of Minnesota. In 1857 was a Delegate to the American Medical Association. Being rather indolent and of convivial habits, he lost the place as a practitioner which his talents and undoubted skill should have given him, and in his last years was made unhappy by the thoughts of "what might have been." He was always a polished gentleman, and few men had warmer friends. He left a wife and four children.

D. W. HAND, M.D.

Purdy, Jotham, M.D., was born in Westchester County, New York, May 4, 1799; died at his residence in Elmira, New York, in 1858. He studied medicine in the offices of Dr. Oliver, Dr. Spencer, and Dr. Beers, of Danby, New York. He graduated in medicine from the College of Physicians and Surgeons, New York, in 1822. He had been licensed by the Board of Censors of the Tioga County Medical Society to practise for two years before graduation. He settled in Elmira immediately after graduation, where he lived in the enjoyment of a large and successful practice until his death. He was elected a member of the American Medical Association in 1853.

C. W. BROWN, M.D.

Saulisbury, Stephen, M.D., son of Samuel and Nancy Saulisbury, was born in Boston, Mass., Sept. 10, 1812; died of Bright's disease Sept. 12, 1875. He was of an old and highly respected family of that city, and enjoyed in early life every advantage of careful and judicious training. He was prepared for college at the Boston Latin School, entered Harvard University at the early age of fifteen years, and graduated in the class of '32.

He immediately commenced the study of medicine under the instruction of Drs. Jackson and Bigelow, and received his medical degree from Harvard in 1835. He was House Surgeon of the Massachusetts General Hospital for a year, and then went to Paris to complete his studies in the schools and hospitals of that city.

Soon after his return he entered upon the active duties of his profession in Medway, Mass., where he soon acquired a good and rapidly increasing practice.

January 2, 1844, he was married to Miss Elizabeth P. Clarke, of Walpole, Mass.

After a few years his business so increased that he found his physical strength unequal to the demands made upon it by a widely-scattered community, and he removed to Brookline, a near suburb of Boston, about the year 1850, hoping to find amid a denser population and the vicinity of the city a life of less exhausting labor. Here his upright character and professional fidelity soon found ample recognition, and here, after twenty-five years of faithful and earnest labor in the profession for which he had an enthusiastic love, he died of Bright's disease, respected by all, and mourned by a large circle of sincere friends.

Dr. Saulisbury was of a modest, retiring disposition, of transparent sincerity and truthfulness, and scrupulously conscientious, with qualities confirmed by the deepest religious convictions and culture.

A life-long student, he was always fully informed of the latest medical improvements and discoveries; kind hearted and sympathetic, his services were ever at the command of the poor as promptly as of the rich and influential; tender and affectionate, he was idolized in his own home; leading a blameless Christian life, he was an ornament to the church of which he was a member; a good citizen, a staunch and loyal friend, a kind neighbor, he was, above all, the faithful, beloved physician.

Data from Dr. D. B. Van Glyck.

L. F. WARNER, M.D.

SCRIBNER, JAMES WILLIAM, M.D., of Tarrytown, New York, was born in Westchester County, New York, Jan. 17, 1820; died in the same place, of a cancerous affection of the stomach, Jan 28, 1880. He was the son of a prominent physician whose ancestors were residents of Westchester County prior to the Revolution. His grandmother on his mother's side was an Ireland, a relative of Dr. Ireland, at one time Surgeon-General of Ireland. The subject of this sketch until the age of fifteen attended the public schools, when he was transferred to a classical Academy at Bedford, over which Samuel Holmes presided. Having become measurably proficient in the languages and in mathematics, he began the study of medicine with his father, who was then and had been for many years one of the physicians of the Westchester Almshouse, where he had ample opportunity for seeing hospital practice. After attending three courses of lectures at the College of Physicians and Surgeons in the city of New York, he graduated M.D. in 1847. The following year Dr. Scribner began practice in his native town, where he continued to reside in the enjoyment of a good professional business until the time of his death.

Dr. Scribner early acquired a responsible and remunerative practice by falling heir to his father's good name and established business on his death, and also became his successor in attendance at the almshouse. This institution was one of the best organized public charities in the State, and owed much of its

efficiency to the executive ability, skill, and sound judgment of the doctor.

Dr. Scribner as a physician was learned and attentive, and as a surgeon skilful and full of resources. His medical brethren accorded to him high and sound professional attainments. He therefore enjoyed consulting practice as well as the honors of official position in the various medical organizations of his town and section of the State.

He was a member of the Westchester County Medical Society, and at different times filled most of its offices, including that of the Presidency; a member of the New York State Medical Society, the American Medical Association, the Rocky Mountain Medical Association, and an honorary member of the California State Medical Society. He was for many years an active member of the Westchester Agricultural Society, and served it as a director and as President. He was one of the trustees of the village corporation and the presiding officer. Dr. Scribner was united in marriage to Margaret E. Miller, who survives him with two daughters, Josie and Ella.

Data from Dr. Husted, and from the Transactions of the Rocky Mountain Medical Society.

J. M. T.

Smith, Robert Mark, M.D., of Athens, Ga., was born in Paterson, Sussex County, N. J., January 13, 1826; died of paralysis, at Gainesville, Ga., February 1, 1879.

His remains were interred in the cemetery at Athens. He was the son of Terrance and Margaret (Inglis) Smith of Paterson, N. J. His parents removed to Athens, Ga., when the subject of this notice was twelve years of age. After having acquired a fair education he entered the drug-store of Dr. Chas. M. Reese, where he studied practical pharmacy, and began the study of medicine. He then attended lectures at Jefferson Medical College, Philadelphia, Pa., where he graduated M.D. in 1846. Dr. Smith was at this time anxious to enter the navy, and studied, and passed a successful examination, but close and prolonged study had severely affected his health, which for over a year remained very precarious. In the mean time he was preparing for a general practice, and finally abandoned the purpose of entering the navy, and began practice in Athens, Ga., some time in 1847.

He had a preference for surgery, and was quite a successful operator, but was at the same time a well-informed and skilful general practitioner. When the war between the States broke out, he was appointed surgeon of the 16th Georgia Regiment, serving in his professional capacity until the close of the war. Returning to Athens he resumed his professional duties. He was twice elected mayor of the city, serving four years. He was a member of the American Medical Association since 1869, a member of the Georgia State Medical Society, and also a member of the State Board of Health.

He was a warm supporter of all measures looking to general education, and was at the time of his death one of the trustees of the Masonic Female College located at Covington, Ga. He also held the chair of Medical Jurisprudence in the law department of the University of Georgia. He was a member of the Phi Kappa Society of the University.

He joined the Masonic order, March 1, 1850, and the following year was elected Worshipful Master, a position to which he was annually re-elected for ten years. In 1873 he was an officer in the Grand Lodge of Georgia. He was a bright member of the Ancient Scotch Rite, and received the thirty-third degree in 1876. He was a man of fine address, attentive to his duties, and was exceedingly popular as a citizen and a physician.

He was united in marriage to Rosanna Jane, daughter of Alexander Pringle, August 9, 1853, by whom he had four children, two sons and two daughters. Dr. Smith was buried with Masonic honors. A memorial sketch of the doctor's life was published by the Mount Vernon Lodge, from which these facts are chiefly taken.

J. M. T.

SMITH, THOMAS, M.D., of Society Hill, S. C., was born in England, but came to the upper counties of South Carolina in boyhood; died at his residence in 1875. The subject of this sketch graduated at the South Carolina College in 1810. He was a man of scholarly tastes and literary ability, and two years after leaving college was elected to take charge of St. David's Academy, at Society Hill, which was then a school receiving a large patronage. He conducted the institution with success for some years, when he resolved to study for the medical profession, and began a systematic course to that end.

He attended medical lectures at the University of Pennsylvania, where he graduated M.D. in 1821. He returned to Society Hill and began the practice of his profession, and soon acquired a good remunerative business, which he possessed for about fifty years. Shortly after beginning practice he was united in marriage to the widow of Judge Wilde. Being a man of culture and ample means, he travelled extensively through Europe. As age came on he quietly settled down to the management of his plantation and a limited professional business. He had early collected one of the best private libraries in the South, which afforded him a vast amount of pleasure. He was for many years one of the trustees of the South Carolina College; he was a member of the South Carolina Medical Society, and the American Medical Association. He never took much part in politics, but in 1860 was an advocate of secession and a member of the convention which withdrew the State of South Carolina from the Union. He was a man of wide influence in the part of the State where he resided, and beloved as a physician and a citizen.

Data from Dr. P. E. Griffin.

J. M. T.

SNYDER, JOHN M., M.D., of Georgetown, D. C., was born Dec. 21, 1827; died suddenly in Georgetown, Aug. 3, 1863. His education, until he was sixteen years of age, was at Mr. Sanborn's Academy, in Charlestown, W. Va., where he acquired a fair knowledge of the classics, mathematics and belles-lettres. His father removed with his family to Tennessee, when the subject of this sketch again had the advantage of the best schools available.

Having selected medicine for a profession, he began the study of it in his twentieth year. The excitement attending the war with Mexico was so great that, his martial spirit being aroused, he left off his studies and joined the 4th Regiment of Kentucky Volunteers; he served one year, and returned as Assistant Surgeon in charge of sick and wounded sent back to the States. On the close of the Mexican war he resumed his studies at the University of Louisville.

In Louisville he was an office-student of Prof. S. D. Gross. A warm friendship was established between the preceptor and pupil which lasted undiminished through life. In 1849 he at-

tended lectures at the University of New York, where he graduated M.D. in 1850.

The doctor selected Georgetown, D. C., as the place to practise his profession, and formed a partnership with D. H. Magruder, which relation continued for about two years, and was dissolved by mutual consent.

In 1853 Dr. Snyder was elected to the chair of Surgery in the medical department of the University of Georgetown. This chair, a few years later, was exchanged for that of Obstetrics. His professorship lasted until 1857, when he retired to attend more closely to his private practice, which had become quite large and responsible.

In 1853 Dr. Snyder was united in marriage to Sophia C. Tayloe, daughter of Wm. H. Tayloe, of Mount Airy, Richmond County, Va. Four children were born to them, three sons and one daughter, who with the mother survive him. In 1853 the doctor was confirmed in the Episcopal Church by Bishop McIlvane, and attached himself to Christ Church, Georgetown, D. C. He was for many years one of the vestrymen of this church.

Dr. Snyder was a member of the Medical Society of the District of Columbia, and a member of the Medical Association of the District, and also a member of the Pathological Society of the District of Columbia. He was elected a member by invitation of the American Medical Association, and made a member of the Committee of Arrangements, when that Association met in Washington in 1858.

Although a man of scholarly tastes, and particularly well informed in his profession, and competent to write, I am unacquainted with any publications from his pen.

On the announcement of his death a called meeting of the Medical Society of the District of Columbia was held, and appropriate resolutions passed by that body, which are printed in the *National Intelligencer* of Aug. 8, 1863. The students of the medical department of Georgetown College also held a meeting and adopted a series of resolutions expressive of the strong attachment to Prof. Snyder, which may be seen in the *National Intelligencer* of Aug. 11, 1863. Both the bodies attended his funeral; his remains were deposited in Oak Hill Cemetery, Georgetown, D. C.

J. M. T.

SPRAGUE, J., M.D., was born in Providence, R. I.; died of a cerebral disease at his residence in Dubuque, Iowa, November 20, 1878. He was liberally educated, and took his medical degree from the Reserve Medical College of Ohio. Shortly after this, in 1847, he located in Dubuque, and acquired and maintained a large and responsible professional business. He was highly esteemed for his professional skill, and particularly successful in the treatment of the diseases of children. Dr. Sprague was an invalid for a number of years, but enjoyed the confidence of the profession and the country.

H. B. BRANSON, M.D.

THEOBALD, ELISHA WARFIELD, M.D., son of Dr. Samuel Theobald, was born in Georgetown, Kentucky, on July 11, 1818; died at Greenville, Mississippi, March 24, 1851. He was educated in Lexington, Kentucky, and graduated Doctor of Medicine in Transylvania University in 1839. He commenced the practice of medicine in conjunction with his father, Dr. Samuel Theobald, in Lexington, Kentucky. After two years he left Lexington for Baltimore, Maryland, where he commenced his professional labors in the spring of 1841. At this time he married the eldest daughter of Prof. Nathan R. Smith, of the University of Maryland. Dr. Theobald devoted himself with great constancy and assiduity to the highest duties of his profession. In July, 1855, Dr. Theobald began to exhibit symptoms of pulmonary disease, and in October of that year he was compelled to relinquish practice. He passed the months of October and November in Greenville, Mississippi, but finding no improvement he went to the Island of Cuba. After a brief stay there he returned to Greenville, Mississippi, where he died.

JOHN MORRIS, M.D.

THOMAS, JOHN MOYLAN, M.D., was born in Anne Arundel County, Md., September 26, 1805; died at his residence in Washington City, October 16, 1853. His father was Philip S. Thomas, a highly respectable farmer. He received his preliminary education at St. Mary's College, Baltimore, studied medicine, and graduated at the University of Maryland in 1826. He commenced the practice of his profession at the place of his nativity, and a few years after moved to Washington City. Possessing great refinement of manner added to a comely and graceful per-

sonal appearance, his intellectual cultivation soon introduced him to an extensive practice among the most prominent citizens and government officials. He was a member of the various medical societies of his neighborhood, also of the American Medical Association. About 1842 he was appointed Professor of Physiology in the medical department of Columbian College, now National Medical College, which office he filled acceptably for many years. On July 25, 1829, he married Miss Sarah Brooks Lee Ringgold, an accomplished daughter of the late Frank Ringgold, Marshal of the District of Columbia. Of a large family of children several are living, one a prominent member of the bar in Philadelphia.

GRAFTON TYLER, M.D.

THOMAS, RICHARD CURD, M.D., was born in Bowling Green, Ky., on the 16th of March, 1838, and died suddenly on the morning of December 27, 1879, while on a professional visit to Judge Hines. Dr. Thomas was the son of the late Judge H. K. Thomas, of Bowling Green. After acquiring the rudiments of an English education, he became a favorite pupil of the celebrated Josiah Pillsbury, and finally entered Bethel College, at Russellville. While pursuing his studies in the senior class, he became infatuated with the idea of studying medicine, and left college to enter the office of Dr. S. W. Coombs, his half brother. He afterwards attended a course of lectures in the medical department of the University of Nashville, and graduated in Jefferson College, of Philadelphia, in 1861. On his return home from Philadelphia, he at once espoused the cause of the Confederacy, for the establishment of which recruits were being then rapidly enlisted. The tocsin of war had sounded throughout the whole of the Southern States, and young Thomas, fired with that spirit of patriotic pride which led so many thousands into the shadows of death, put his armor on, and began a brilliant career as a Surgeon; first in the hospital of Buckner's army at Bowling Green, afterwards at Nashville, and, later, in Atlanta and Tupelo. Wherever he went, his cunning hand and suave manner made him fresh renown. At the close of the war, Dr. Thomas returned to Bowling Green, and soon acquired the largest private practice ever held by any physician in that city.

He was, at the time of his death, local surgeon to the L. N. and G. S. R. R., a member of the State Board of Health, of the local

Medical Society at Bowling Green, of the Kentucky State Medical Society, and of the American Medical Association. Dr. Thomas, though a frequent contributor to the medical press, has left no literary work of a permanent character.

DUDLEY S. REYNOLDS, M.D.

TOLAND, HUGH HUGHES, M.D., of San Francisco, Cal., was born in Newberry, S. C., in 1808; died suddenly of apoplexy at his residence in the city of San Francisco, February 27, 1880. The doctor received a good collegiate education. His medical degree was obtained at the Transylvania Medical College, Lexington, Ky., in 1832. Shortly after this he went to Europe for further study in the line of his profession. Returning to South Carolina, he opened an office, and practised his profession in Columbia until about 1851. In 1852, he contracted a second marriage, and removed to California with his bride. His health was then poor, and he sought a rural situation. He bought about this time what is now known as the "Givin Mine," in Calavaras County, which he worked for about ten years, when he returned to the city of San Francisco, and formed a partnership in practice with Dr. McMillen; this partnership was of short duration. Dr. Toland, however, from that time continued to be actively engaged in a large and lucrative professional business. For the past fifteen years it is believed that he enjoyed the largest and most lucrative practice of any physician in the State. He was a man of fine physique, industrious and correct habits, and capable of performing a prodigious amount of labor. For many years, and ever after his fame brought him more business than he could possibly attend to, he gave a portion of his office hours to serving the poor gratis, and attended them with the same skill and tenderness that he did those who were in affluence, and able to pay him liberally. To his patients he was the kindest and most gentle of men; to the poor, his loss is a public calamity. To the needy he was liberal with his means, as well as generous with his professional aid. We copy the following, relative to Dr. Toland, from the March number of the *Pacific Medical and Surgical Journal* (p. 478):—

"Few persons ever so combined in their character the elements of success. His industry was untiring, his activity almost sleepless, his perseverance almost indomitable. As a surgeon, he was remarkably successful, his success being partly due, no doubt, to

the avoidance of unpromising cases, as well as to the careful treatment of patients after operation. He was a member of the City Board of Health, one of the visiting surgeons of the County Hospital, and Professor of Surgery in the medical department of the State University, of which he was the founder, and with which his name is identified as the donor of its valuable edifice. Dr. Toland wrote but little; with the exception of occasional contributions to medical journals, the only work bearing his name is the Treatise on Surgery, which was issued but a few years prior to his death. He was one of the few members of the medical profession who die rich."

The members of the American Medical Association who had the pleasure of attending the meeting of that association in San Francisco, in 1871, will not need to be reminded of his elegant home and princely hospitality. He gave breakfast and dinner parties daily to large parties of medical gentlemen, strangers in the city, during the convention. His accomplished lady was a most efficient aid to the doctor in his agreeable and acceptable, though lavish hospitality.

I cannot do better in my effort to illustrate the doctor's character than to quote the closing paragraph of a well-conceived notice of the life and character of Dr. Toland which appeared in "The Call" of February 28, 1880:—

Dr. H. H. Toland being a man of quiet, unostentatious manner, only those coming within the circle of his benefactions were at all aware of their magnitude. In 1865, Dr. Toland built the Toland Medical College, situated on the corner of Stockton and Pfeifer Streets, between Chestnut and San Francisco Streets. The old building is now a notable landmark in the northern portion of the city. He had been President of the Faculty until 1874, when he donated the building and entire property, together with the adjoining building, to the State University. The property was valued at $100,000, and the gift unincumbered with conditions. After the transfer, he was appointed Professor in Surgery of the Faculty. It is stated that after the transfer to the regents of the University, he asked that the college should retain his name, but his request was refused. A committee is now considering a bill before the legislature, providing that the college shall be designated as "The Toland College of the University of California." At the time of his death, he had entirely given up lecturing on surgery in the University, but continued clinical

lectures in the County Hospital. The only public office Dr. Toland ever held was that of member of the City Board of Health. He was appointed by Governor Haight, and reappointed by Governors Booth and Irwin. He always took a deep interest in the proceedings of the Board, and bestowed much time and attention thereto.

By his second wife Dr. Toland had two daughters, both married. One was the late Mrs. Glassel, who died about six months ago, in Los Angeles, and the other Mrs. Sims, widow of the late John Sims, an old pioneer banker. The latter lady is now residing in this city. In 1858, Dr. Toland married the present Mrs. Toland, and purchased the residence on Jackson Street from Dr. Wm. M. Givin. For a long time previous to his marriage, Dr. Toland resided at the International Hotel, and subsequently at the Roberts House, corner of Washington and Jackson Streets. The residence on Jackson Street is a model of comfort and elegance, well adapted to the entertainments so frequently given by Dr. and Mrs. Toland, and which were characterized by the most generous liberality and sociability. Both were members of Dr. Platt's congregation, and assisted Grace Church financially, on many occasions, when calls were made for the building and maintenance of the church. Dr. Toland leaves a widow and two children, Mrs. Sims, and a boy eleven years of age, the former by his second wife, and the latter by his third. Besides these, there are thirteen grandchildren. Dr. Charles G. Toland is the son of the surviving wife by a former husband. The value of the estate of Dr. Toland is estimated at $1,500,000 to $2,000,000. In addition to his professional income, he derived a large revenue from judicious land investments. He was possessed of considerable property in the interior, including a large ranch near Rio Vista, on which he annually raised large crops of wheat. About a year ago he sold his crop for something like $125,000. Dr. Toland was six feet one inch in height, and of erect and dignified carriage, until a year or two ago, when he grew stout, but maintained a dignified gait. He was very welcome and agreeable in the social circle, and made friends everywhere. He was a member of many prominent medical societies, and well known throughout the State, his career having been a remarkably brilliant and successful one. In politics, although a pronounced Democrat, he never appeared prominently in any party convention.

The following notice published by the President of the Board of Health is self-explanatory:—

FEBRUARY 27, 1880.

T. J. SHACKELFORD, SECRETARY OF BOARD OF HEALTH: In consequence of the sad and sudden death of one of the most honorable members of the Board of Health, as well as one of the most eminent and respected of our citizens, Dr. H. H. Toland, and for the purpose of giving suitable expression to our regrets for the afflictive dispensation, I will ask you to call a meeting of the Board of Health at the Mayor's office to-morrow morning at 10½ o'clock. Respectfully,

J. S. KALLOCH, *President.*

Dr. Toland was a member of the California State Medical Society, and was honored in it by being elected to its highest office; the San Francisco Medical Society, and was one of the early physicians to the Marine Hospital in San Francisco. But his life was too busy a one to allow him to give much time to medical societies or political organizations, or to writing out his observations and experience in practice as a surgeon and physician, which latter fact is to be more regretted, as they would have been a valuable legacy to the profession. His Report on Surgery to the State Medical Society—and which is published, with illustrations, in the Transactions of the Society for 1874–75—is full of interest, and shows his genius and power of originality in cheiloplastic surgery. But he has gone to his reward, honored by his professional brethren, and beloved by the whole country in which he lived.

J. M. T.

TREICHLER, JACOB F., M.D., was born near Kintnersville, Bucks County, Pa., November 27, 1806; died at McKeansburg, Schuylkill County, Pa., on Wednesday morning, the 11th of June, 1879, in his seventy-third year. His death was very sudden, and as he was of very full habit, it is probable that apoplexy was the cause of his sudden demise.

He came to Schuylkill County from Bucks in 1830, and at once became a resident of McKeansburg. He received the degree of M.D. from the University of Pennsylvania, and for almost half a century led a useful life in his profession. He had great theoretical and practical skill, and always kept up with the advance of medical science. Ever since his residence in the county he

was a member of the Medical Society, and for many years was its mainstay. He was the last of the pioneer doctors of this county.

Dr. Treichler was greatly interested in education, and was the originator of the first school-district, outside of the large towns, of Schuylkill County. He was Coroner one session, and for a long time was the surveyor, conveyancer, and lawyer for the neighborhood. He was a Mason and an Odd-Fellow, and stood high in both orders, in the former having taken all degrees possible.

He first married Mary Moser, of McKeansburg, March 7, 1839, who died February 16, 1847. This marriage resulted in three children, two sons and one daughter. On September 4, 1867, he married his second wife, L. J. Bretz, of Carlisle, Pa., who is still living. No children from second marriage.

His oldest son, Claudius Galen Treichler, of Honeybrook, Pa., is a graduate of Pennsylvania College, and also a graduate of the University of Pennsylvania in 1865, a member of the Chester County Medical Society, and a permanent member of the State Medical Society, and a fellow of the American Academy of Medicine. His daughter, Cordie C., now Mrs. Pile, is the second child. Lewis A. is the youngest, and has a drug-store in Germantown, Philadelphia, Pa.

Dr. Treichler was repeatedly appointed delegate to other State medical societies, and was more than once President of Schuylkill County Medical Society. He wrote several short articles for medical journals. He never performed any important surgical operations.

At various times he filled local offices, and in all the surrounding country was looked up to as being a very superior man.

C. G. T.

VAN WYCK, JOHN C., M.D., was born in Baltimore, Md., in 1828; died suddenly at his residence in Oakland, Cal., August 19, 1877. He was among the leading surgeons of Alameda County, respected by his associates in the profession, and beloved by all who knew him. He became a pupil of Dr. N. R. Smith in or about 1846, and graduated from the University of Maryland in 1848.

Dr. Van Wyck came to the Pacific coast in 1863, and settled in Oakland, Alameda County, in 1864 or 1865. He soon as-

sumed a prominent position in his profession, and abundant evidence of the esteem in which he was held by his medical associates is seen in the fact of his election as President of the Alameda County Medical Society soon after its formation. He was a member of the California State Medical Society, and a member by invitation of the American Medical Association. He was the author of several papers upon medicine; among others, a Report on the Practice of Medicine for the State Medical Society. Of this society he was at one time a member of the board of censors.

F. W. HATCH, M.D.

VEEDER, LOUIS, M.D., was born in Harbach, Austria, Sept. 9, 1816; died in Elmira, N. Y., June, 1877. His early education was obtained at a convent school in Kreusmunster, Austria. He afterwards entered the University of Vienna, where he graduated in medicine at the age of thirty-one. He then spent three or four years in travel, and did not settle for the practice of medicine in Germany. At thirty-five he came to America and settled in Dansville, Livingston County, New York, where he was engaged in successful practice for fifteen years. He came to Elmira in 1865, and continued practice until a few weeks before his death.

He had been President of the Chemung County Medical Society and Secretary of the Elmira Academy of Medicine; was elected Delegate to the American Medical Association in 1870. He had been President of the Elmira Board of Health, and at the time of his death was one of the inspectors of health.

C. W. BROWN, M.D.

WADDEL, THOMAS, M.D., of Toledo, Ohio, was born in Canada in 1843; died at his residence in Toledo, March 9, 1879. He came to the States in 1865, as he attended that year a course of medical lectures at the University of Buffalo. In 1871 he received the degree of M.D. from the University of Wooster, Cleveland, Ohio. He then settled to practise in Toledo, where he soon ranked among the leading physicians. He identified himself with the Toledo School of Medicine as lecturer on gynæcology, was on the medical staff of St. Vincent's Hospital, and a member of the Board of Health. He was a member of the Toledo Medical Association, the Ohio State Medical Society,

and the North Western Ohio Medical Society, and the American Medical Association. He was a ready and forcible writer, and one of the editors of the Toledo *Medical and Surgical Journal.*

Data from Dr. Starling Loving.

J. M. T.

WALSH, JOSEPH, M.D., of Washington City, was born in Dublin, Ireland, Oct. 28, 1806; died of pneumonia at his residence in Washington, Nov. 9, 1879. He was the son of Joseph and Margaret (Corrigan) Walsh, of Dublin, who carried on a dyeing establishment in that city. The doctor received a good education at a Jesuit college in Dublin. He then became apprenticed to the drug business, and studying pharmacy graduated as an apothecary at Apothecary Hall, Dublin, Ireland, in September, 1828. He was fond of travel, and, after visiting different parts of the world, came to America, and settled in Washington. Dr. Walsh obtained a position in the hospital belonging to the Marine Barracks in that city, and while holding this position read medicine and attended lectures at the medical department of Columbian College, where he graduated M.D. in 1843. After receiving his medical degree he began practice, and was then employed for a number of years as Contract Physician to the Marine Barracks, discharging all his duties with fidelity and to the satisfaction of the officers in charge. During the late war he served as Contract Surgeon in the United States Army in the hospitals at Washington. Dr. Walsh was united in marriage Sept. 7, 1843, to Elizabeth, daughter of William and Malinda (Tench) Smith, of Washington City. This union was a happy one, and resulted in thirteen children, seven sons and six daughters.

For many years he was actively and laboriously engaged in the duties of his profession in the southeastern section of the city, where he was well and favorably known as a good citizen and a skilful and attentive physician. He was an ardent advocate of temperance, encouraging organizations to that end, frequently lecturing in public upon the evil that flows from the use of ardent spirits. He always enjoyed excellent health, was of an active, sanguineous temperament, zealous and persevering in whatever he was engaged. He was in personal appearance erect, over six feet in height, and with an intellectual cast of features. Dr. Walsh was a member of the Medical Society

of the District of Columbia, and also of the Medical Association of the District of Columbia, and became a member of the American Medical Association in 1870. He was a man of noble instincts, and a firm supporter of medical organizations, and maintained the most honorable relations with his professional brethren.

On the announcement of his death, the Medical Society of the District of Columbia held a special meeting, and passed appropriate resolutions of respect for his memory and of condolence with his bereaved family; they also attended his funeral in a body. He was a practical member of the Roman Catholic Church. His funeral took place from St. Matthew's Church, on which occasion his old pastor and personal friend, the Rev. F. E. Boyle, preached an eloquent sermon, illustrative of the character of Dr. Walsh, and of the self-denials and labors of the physician.

Dr. Walsh's remains were followed by a large number of his friends to Mount Olivet Cemetery, where they were interred.

J. M. T.

WATERHOUSE, MARION, M.D., of Portage, Wis., was born September 19, 1827, in New York; died of malignant disease at his residence, October 19, 1878.

He removed to Wisconsin when about 14 years of age, and lived on a farm until 1853, when he had the misfortune to break his left leg badly, which ever after remained crippled.

In the following summer he determined to study medicine, which he did, graduating at Rush Medical College in Chicago, in 1864. In the same year he was commissioned First Assistant Surgeon in the First Regiment of Wisconsin Heavy Artillery. In this position he won the esteem of all who knew him. He remained in the army until the close of the war, when he removed to Portage, Wisconsin, where he resided until his death. Soon after taking up his residence in Portage, he had still another accident to the crippled limb, by which the neck of the femur was broken.

Dr. Waterhouse became a member of the Wisconsin State Medical Society in 1867, was elected Vice-President of the Society in 1871, and President in 1873. In 1870 he was one of its delegates to the American Medical Association, of which body he remained a member until his death.

For several years previous to his demise Dr. Waterhouse had

suffered with a suspicious and painful ulcer on the heel of the crippled limb. It resisted all treatment and obstinately grew worse, until in the early part of the winter of 1878 he decided to undergo amputation of the leg. This was performed six inches below the knee, on the 10th of January, 1878. The stump healed kindly, and in a few weeks he was able to ride out. But about the first of May a small purplish-red tumor appeared on the end of the stump; this tumor increased in size until in the course of a few months the whole end of the stump became involved, also the lymphatic glands in the groin, showing unmistakable evidence of malignancy. The disease made rapid progress until it terminated his life.

Dr. Waterhouse commenced the study of medicine in obscurity and adversity, but by his industry and perseverance, he overcame obstacles that would have disheartened many. He won a high place in his profession. He was a true physician, ever ready and willing to serve the poor and relieve the suffering; he never shrunk from his duty, nor flinched in its performance.

J. T. REEVES, M.D.

WRIGHT, MARMADUKE BURR, M.D., was born at Pemberton, Burlington County, N. J., Nov. 10, 1803; died at his residence in Cincinnati, Ohio, Aug. 15, 1879.

His preliminary education was obtained principally at the Trenton Academy, under Dr. Elijah Slack, who was subsequently Professor of Chemistry in the Medical College of Ohio.

Dr. Wright began the study of medicine at the age of sixteen, under the tuition of Dr. John McKelway, of Trenton, a graduate of Edinburgh.

He attended three courses of lectures in the University of Pennsylvania, and graduated M.D. from that institution in 1823, when a little over nineteen years of age; his thesis on the occasion was on Fistula Lacrymalis.

He commenced practice Nov. 10, 1823, at Columbus, Ohio, where he resided until 1837 or 1838, when he was appointed Professor of Materia Medica in the Medical College of Ohio, having for his associates, Professors R. D. Mussey, John Morehead, Jared P. Kirtland, J. T. Shotwell, and John Locke.

In 1840 Dr. Wright was transferred to the chair of Obstetrics, which he held until 1850, when by action of a majority of the

Board of Trustees he was removed. In 1860 he was again appointed to the chair of Obstetrics, which he resigned in 1868, and was immediately elected Professor Emeritus.

Dr. Wright had a vigorous intellect and was most industrious in study; he had a strong will and faltered at no common obstacle; when young a night-ride of fifteen miles through the unbroken wilderness was no uncommon or special hardship for him.

In his earlier years he had, like most young men, a preference for surgery, and performed many difficult operations with credit to himself. One of his first exploits in this department was the successful ligation of the internal iliac artery in a cow, in which that vessel had been partially severed by a stab.

As early as 1838 he manifested strong interest in politics, and was elected from Franklin County to serve as Representative in the State Legislature, and was the youngest member of that body. During his term of service as representative he had characteristic controversies with his political opponents, in which he generally proved the winner. While he had wonderful control, "no man attacked him with impunity, forensically or physically, and those who assailed him generally came off second best."

While in the Legislature, in connection with Dr. W. M. Awl, his attention was called to the condition of the insane, who then, throughout the State, were "confined in jails, out-houses, and cellars." Mainly through the efforts of these two gentlemen, the present State asylums were founded.

From the beginning of his career his interest in his profession was manifested in writing his experiences. One of his first articles was "On Scurvy, as it appeared in the Ohio Penitentiary in 1835." Dr. Wright was physician to the Ohio Penitentiary at the date mentioned, and the article appeared in the *Western Quarterly Journal of Practical Medicine*, published by Prof. Eberle, for June, 1837. He wrote with facility, and contributed many other valuable papers to the literature of the profession.

In 1839 he delivered an introductory address on "The Physiological and Therapeutical Uses of Water." In 1841, on "The Incidents of Professional Life." In 1843, on "The Science of Medicine as a Compilation of Truths." In 1845, on "Drunkenness and Insanity." In 1846, on "The Experimentation and Dis-

section of Human Bodies." In 1847, on "The Qualifications of Professors and Students," etc.

Among biographical sketches were those of Dr. John Latta and Prof. John Locke, in 1852 and 1857.

In 1859 he wrote for the Ohio State Medical Society a notable paper on "Drunkenness, its Nature and Cure; or Asylums for Inebriates."

In 1875 he read a paper before the American Medical Association on "Pigmentation, a Rose Disease among Infants," which was published in the Transactions for that year.

His greatest effort, that which attracted the attention of the medical world, is his Prize Essay on "Difficult Labors and their Treatment," read before the Ohio State Medical Society in 1854.

This first attracted general attention to "Cephalic Version, or the correction of malpositions in utero by external and internal manipulation."

Dr. Wright did not claim priority in the use of this method, but to have been very successful in its application to practice. There is good reason to believe that, if he did not originate the precise method which he used, he made great improvement on what was previously known concerning it, and whatever may be claimed by others the name of M. B. Wright will be always associated with "cephalic version."

In 1854, in connection with Drs. Newberry and Thompson, as a committee of the State Medical Society to review the Code of Ethics, he recommended the following, which is characteristic of the man, and which the Society came near adopting, but counsels wise or unwise prevailed against it:

"Resolved, that the Ohio State Medical Society does not require the existence of any code of ethics, as such, to secure kindness of intercourse, concert of action, and scientific improvement among its members; that the great moral code containing the injunction, 'Do unto others as ye would they should do unto you,' and our feelings and knowledge as gentlemen, are as efficient as anything can be in promoting a true and unexceptional spirit of social and professional intercourse."

Dr. Wright thought with many others that the code does not restrain those who wish to evade its restrictions, and that the code as it exists is not necessary among gentlemen. Besides those already mentioned the doctor filled during his life many positions of honor and trust, and was a member of many societies.

He was the Health Officer of Cincinnati in 1861. For thirty years he was one of the medical officers of the Cincinnati Hospital, and was, if anything, more faithful to the unfortunates there than to his wealthy patients outside. He was one of the founders of the Ohio State Medical Society, and continued his membership many years, being once or twice its President. He was a member of the Cincinnati Academy of Medicine, and its President in 1864. He was a member of the American Medical Association, corresponding member of the American Society of Physicians of Paris, honorary member of the American Gynæcological Society, and of the Cincinnati Obstetrical Society. He was for many years the Dean of the Medical College of Ohio, and after resigning the chair of Obstetrics, as already stated, was elected Emeritus Professor, which title he held at the time of his death.

Not content with what could be obtained in his own country, he spent much time in Europe at the seats of learning, where if he gained much he also taught something.

He was a man of fine presence and pleasing manners, but withal a little inclined to hauteur. He was kindly-hearted, as thousands will testify, and lost no opportunity to advance the interests of his profession. His dealings were honorable, and his intercourse with his brethren characterized by unselfishness and a regard for the reputation of his fellows.

He was a fine lecturer, and a faithful teacher. In his family he was kind and affectionate, to his friends he was loyal, while to his enemies he was just, and after the contest forgiving.

He was a most sagacious and successful practitioner of his art, and had not many equals as an obstetrician. He was in active practice for nearly fifty years, and to the last kept abreast with the march of progress.

"His life was noble, and the elements so mixed in him that Nature might stand up and say to all the world, 'This was a man.'"

In 1835 Dr. Wright was united in marriage to Miss Mary E. Almstead, by whom he had four children.

Dr. C. A. Wright, of Cincinnati, is his son.

STARLING LOVING, M.D.

WROTH, PEREGRINE, M.D., was born in Kent County, Md., on the 7th of April, 1786, and died in the city of Baltimore on the

13th of June, 1879. He received his literary education at Washington College, Kent County, Md., and at this time imbibed a love of the old Latin authors, which he cherished until the hour of his death. He graduated in medicine at the University of Pennsylvania, and had for his teachers Rush, Physick, and other distinguished men of that day. He commenced the practice of medicine in Chestertown, Kent County, Md., in the spring of 1807. For more than sixty years he enjoyed an extensive practice among all classes of people on the Eastern Shore of the State. In December, 1868, he retired from his professional duties and removed to the city of Baltimore. He was for many years a member of the Board of Visitors and Governors of Washington College, some years Professor of Chemistry in that institution, and later in life President of the Board. He was one of the first members of the American Medical Association (1847), and served on some of the most important committees. Dr. Wroth was the first person to suggest the establishment of a College of Pharmacy in Baltimore, and it was mainly through his influence that the college was inaugurated. Dr. Wroth was a voluminous writer, but the only work he published is a small volume entitled "Clinical Aphorisms in the Endemic Fevers of the Eastern Shore of Maryland." He left, however, several volumes in manuscript, chiefly on moral and religious subjects.

JOHN MORRIS, M.D.

PLAN OF ORGANIZATION

FOR A

NATIONAL MEDICAL ASSOCIATION.

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NATIONAL MEDICAL ASSOCIATION.

Whereas, The Medical Convention, held in the city of New York, in May, 1846, have declared it expedient "for the medical profession of the United States to institute a National Medical Association;" and,

Inasmuch as an institution so conducted as to give frequent, united, and emphatic expression to the views and aims of the medical profession in this country, must, at all times, have a beneficial influence, and supply more efficient means than have hitherto been available here for cultivating and advancing medical knowledge; for elevating the standard of medical education; for promoting the usefulness, honor, and interests of the medical profession; for enlightening and directing public opinion in regard to the duties, responsibilities, and requirements of medical men; for exciting and encouraging emulation and concert of action in the profession, and for facilitating and fostering friendly intercourse between those who are engaged in it: therefore,

Be it resolved, In behalf of the medical profession of the United States, that the members of the Medical Convention, held in Philadelphia in May, 1847, and all others who, in pursuit of the objects above mentioned, are to unite with or succeed them, constitute a National Medical Association; and that, for the organization and management of the same, they adopt the following *Regulations*:—

I.—TITLE OF THE ASSOCIATION.

This institution shall be known and distinguished by the name and title of "The American Medical Association."

II.—MEMBERS.

The members of this institution shall collectively represent and have cognizance of the common interests of the medical profession in every part of the United States; and shall hold their appointment to membership either as delegates from local institutions, as members by invitation, or as permanent members.

The *Delegates* shall receive their appointment from permanently organized State medical societies, and such county and district medical societies as are recognized by representation in their respective State societies, and from the medical department of the Army and Navy of the United States, and the Marine Hospital Service of the United States.

Each delegate shall hold his appointment for one year, and until another is appointed to succeed him, and shall participate in all the business and affairs of the Association.

Each State, county, and district medical society, entitled to representation, shall have the privilege of sending to the Association one delegate for every ten of its regular resident members, and one for every additional fraction of more than half that number; *Provided*, however, that the number of delegates from any particular State, Territory, county, city, or town shall not exceed the ratio of one in ten of the resident physicians who may have signed the Code of Ethics of this Association. The Medical Staffs of the Army and Navy shall be entitled to four delegates each. The Marine Hospital Service of the United States shall be entitled to one delegate.

No individual who shall be under sentence of expulsion or suspension from any State or local medical society of which he may have been a member, or whose name shall have been, for non-payment of dues, dropped from the rolls of the same, shall be received as a delegate to this Association, or be allowed any of the privileges of a member, until he shall have been relieved from the said sentence or disability by such State or local society, or shall have paid up all arrears of membership; nor shall any person not a member and supporter of a local medical society, where such a one exists, be eligible to membership in the American Medical Association.

No one expelled from this Association shall at any time thereafter be received as a delegate or member, unless by a three-fourths vote of the members present at the meeting to which he is sent, or at which he is proposed.

Members by Invitation shall consist of practitioners of reputable standing from sections of the United States not otherwise represented at the meeting. They shall receive their appointment by invitation of the meeting, after an introduction from, and being vouched for by, at least three of the members present, or three of the absent permanent members. They shall hold their connection with the Association until the close of the annual session at which they are received; and shall be entitled to participate in all its affairs, as in the case of delegates, except the right to vote.

The *Permanent Members* shall consist of all those who have served in the capacity of delegates, and of such other members as may receive the appointment by unanimous vote, and shall continue such so long as they remain in good standing in the body from which they were sent as delegates, and comply with the requirements of the By-laws of the Association. Permanent members shall at all times be entitled to attend the meetings, and participate in the affairs of the Association, so long as they shall continue to conform to its regulations, but without the right of voting; and, when not in attendance, they shall be authorized to grant letters of introduction to reputable practitioners of medicine residing in their vicinity, who may wish to participate in the business of the meeting, as provided for members by invitation.

Every member elect, prior to the permanent organization of the annual meeting, or before voting on any question after the meeting has been organized, must exhibit his credentials to the proper committee, and sign these regulations, inscribing his name and address in full, specifying in what capacity he attends, and, if a delegate, the title of the institution from which he has received his appointment

III.—MEETINGS.

The regular meetings of the Association shall be held annually. and commence on the first Tuesday in May or first Tuesday in June. The place of meeting shall be determined, with the time of meeting for each next successive year, by vote of the Association.

IV.—OFFICERS.

The officers of the Association shall be a President, four Vice-Presidents, one Permanent and one Assistant Secretary, a Treasurer, and Librarian. They shall be nominated by a special committee of one member from each State represented at the meeting, and shall be elected by vote on a general ticket.

Each officer, except the Permanent Secretary, shall hold his appointment for one year, and until another is elected to succeed him. The Permanent Secretary shall hold his appointment until removed by death, resignation, or a vote of two thirds of the members present at a regular annual meeting.

The President and Vice-Presidents shall assume the functions of their respective offices at the beginning of the annual meeting next succeeding their election; all other officers shall enter upon their duties immediately after their election.

The President shall preside at the meetings, preserve order and decorum in debate, give a casting vote when necessary, and perform all the other duties that custom and parliamentary usage may require.

The Vice-Presidents, when called upon, shall assist the President in the performance of his duties, and during the absence, or at the request of the President, one of them shall officiate in his place.

The Permanent Secretary shall record the minutes and authenticate the proceedings; give due notice of the time and place of each next ensuing annual meeting; notify all members of committees of their appointment, and of the duties assigned to them; hold correspondence with other permanently organized medical societies, both domestic and foreign; serve as a member of the Committee of Publication; see that the published *Transactions* are promptly distributed to all the members who have paid the annual assessment, and carefully preserve the archives and unpublished transactions of the Association.

The Assistant Secretary shall aid the Permanent Secretary in recording and authenticating the proceedings of the Association; serve as a member of the Committee of Arrangements, and perform all the duties of Permanent Secretary temporarily, whenever that office shall be vacant, either by death, resignation, or removal.

The Treasurer shall have the immediate charge and management of the funds and property of the Association. He shall be a member of the Committee of Publication, to which committee he shall give bonds for the safe keeping and proper use and disposal of his trust. And through the same committee he shall present his accounts, duly authenticated, at every regular meeting.

The Librarian shall receive and preserve all the property in books, pamphlets, journals, and manuscripts presented to or acquired by the Association, record their titles in a book prepared for the purpose, acknowledge the receipt of the same, and he shall be a member of the Committee of Publication.

V.—STANDING COMMITTEES.

The following standing committees, each composed of seven members, shall be organized at every annual meeting, for preparing, arranging, and expediting business for each next ensuing year, and for carrying into effect the orders of the Association not otherwise assigned, namely, a Committee of Arrangements and a Committee of Publication.

The Committee of Arrangements shall, if no sufficient reasons prevent, be mainly composed of seven members, of whom the Assistant Secretary shall be one, residing in the place at which the Association is to hold its next annual meeting; and shall be required to provide suitable accommodations for the meeting, to verify and report upon the credentials of membership, to receive and announce all essays and memoirs voluntarily communicated, either by members of the Association, or by others through them, and to determine the order in which such papers are to be read and considered.

The Committee of Publication, of which the Secretaries, Treasurer, and Librarian must constitute a part, shall have charge of preparing for the press, and of publishing and distributing such of the proceedings, transactions, and memoirs of the Association as may be ordered to be published. The six members of this Committee, who have not the immediate management of the funds, shall also, in their own names as agents for the Association, hold the bond of the Treasurer for the faithful execution of his office, and shall annually audit and authenticate his accounts, and present a statement of the same in the annual report of the Committee; which report shall specify the character and cost of the publications of the Association during the year, the number of copies still at the disposal of the meeting, the funds on hand for further operations, and the probable amount of the assessment to be laid on each member of the Association for covering its annual expenditures.

VI.—FUNDS AND APPROPRIATIONS.

Funds shall be raised by the Association for meeting its current expenses and awards from year to year, but never with the view of creating a permanent income from investments. Funds may be obtained by an equal assessment of not more than five dollars annually, on each of the delegates and permanent members; by voluntary contributions for specific objects; and by the sale and disposal of publications, or of works prepared for publication.

The funds may be appropriated for defraying the expenses of the annual meetings, including the necessary expenses of the Permanent Secretary in maintaining the necessary correspondence of the Association; for publishing the proceedings, memoirs, and transactions of the Association; for enabling the Standing Committees to fulfil their respective duties, conduct their correspondence, and procure the materials necessary for the completion of their stated annual reports; for the encouragement of scientific investigation by prizes and awards of merit; and for defraying the expenses incidental to specific investigations under the instruction of the Association, where such investigations have been accompanied with an order on the Treasurer to supply the funds necessary for carrying them into effect.

VII.—PROVISION FOR AMENDMENT.

No amendment or alteration shall be made in any of these articles, except at the annual meeting next subsequent to that at which such amendment or alteration may have been proposed; and then only by the voice of three-fourths of all the delegates in attendance.

Provided, however, that when an amendment is properly under consideration, and an amendment is offered thereto, germane to the subject, it shall be in order, and if adopted, shall have the same standing and force as if proposed at the preceding meeting of the Association.

And, in acknowledgment of having adopted the foregoing propositions, and of our willingness to abide by them, and use our endeavors to carry into effect the objects of this Association as above set forth, we have hereunto affixed our names.

NAMES OF MEMBERS.	RESIDENCE.	INSTITUTION REPRESENTED.

BY-LAWS.

I.—ORDER OF BUSINESS.

The order of business at the annual meetings of the American Medical Association shall at all times be subject to the vote of three-fourths of all the members in attendance; and, until permanently altered, except when for a time suspended, it shall be as follows, viz.:—

1st. The calling of the meeting to order by the President elected the preceding year, or, in his absence, by one of the Vice-Presidents.

2d. The report of the Committee of Arrangements on the credentials of members, after the latter have registered their names and addresses, and the titles of the institutions which they represent.

3d. The reception of members by invitation.

4th. The election of permanent members.

5th. The reading of notes from absentees.

6th. The hearing of the annual address of the President.

7th. The reception of the reports of all special committees and voluntary communications, and their reference to the appropriate Sections.

8th. The appointment of the committee of one from each State represented, to nominate officers of the Association, and to fill the standing committees.

9th. The reading and consideration of the reports of the Standing Committees, of Publication, on Prize Essays, and of Chairmen of Sections.

10th. Resolutions introducing new business, and instructions to the permanent committees.

11th. The selection of the next place of meeting.

12th. The report of the Nominating Committee, and the election of officers of the Association.

13th. Reports from the several Sections.

14th. Reading of the minutes by the Secretary.

15th. Unfinished and miscellaneous business.

16th. Adjournment.

II.—SECTIONS.

The general meetings of the Association shall be restricted to the morning sessions; and the afternoon sessions, commencing at three o'clock, shall be devoted to the hearing of reports and papers and their consideration, in the following *Sections*:—

1. Practical Medicine, Materia Medica, and Physiology.
2. Obstetrics and Diseases of Women.
3. Surgery and Anatomy.
4. State Medicine.
5. Ophthalmology, Otology, and Laryngology.
6. Diseases of Children.

The chairman and secretary of the several Sections shall, like other officers of the Association, be nominated by the special committee of one member from each State represented at the meeting, and elected by a vote on a general ticket. They shall hold their office until the close of the proper business of the annual meeting next succeeding their election, and until their successors are appointed.

The Section on State Medicine shall be composed of one member from each State, one from the army and one from the navy of the United States, representing, as far as practicable, the State Boards of Health. The officers of this Section to be also designated by the Committee on Nominations.

The chairmen of the several Sections shall prepare and read in the general sessions of the Association, papers on the advances and discoveries of the past year in the branches of science included in their respective Sections; the reading of such papers not to occupy longer than forty minutes for each.

It shall be the duty of every member of the Association who proposes to present a paper or report to any one of the Sections, to forward either the paper, or a *title* indicative of its contents, and its *length*, to the Chairman of the Committee of Arrangements at least one month before the annual meeting at which the paper or report is to be read. It shall also be the duty of the Chairman and Secretary of each Section to communicate the same information to the Chairman of the Committee of Arrangements concerning such papers and reports as may come into their possession or knowledge, for their respective Sections, the same length of time before the annual meeting. And the Committee of Arrangements shall determine the order of reading or presentation of all such papers, and

announce the same in the form of a programme for the use of all members attending the annual meeting. Such programme shall also contain the rules specified in the By-laws and Ordinances concerning the consideration and disposal of all papers in the Sections.

No paper shall be read before either of the Sections, the reading of which occupies more than twenty minutes. Such papers shall be referred by the Section to sub-committees especially appointed for their examination. The sub-committees shall be allowed thirty days for such examination; at the end of which time they shall forward the papers to the Committee of Publication, with such recommendation as they may deem proper. The author of such papers, however, may read abstracts before the Section within the allotted twenty minutes. No member shall address the Section more than once upon the same subject, nor speak longer than fifteen minutes without unanimous consent.

All papers presented directly to the Association, and other matters, may, at the discretion of the Association, be referred to the various sections for their consideration and report.

Prize Essays.—There shall be four annual prizes of two hundred and fifty dollars each, which shall be awarded at the close of the second year after announcement, as hereinafter explained, for strictly original contributions to medical and surgical progress.

It shall be the duty of the chairman of each of the following four Sections: 1. Practical Medicine, Materia Medica, and Physiology; 2. Obstetrics and Diseases of Women; 3. Surgery and Anatomy; 4. State Medicine, to appoint annually before the adjournment of the meeting of the Association three members of ability and good judgment, who shall constitute a Committee of Selection, and who shall, within thirty days thereafter, select and publicly announce for competitive investigation and report, a subject belonging to one or other of the branches of medicine included in the title of the Section.

It shall also be the duty of the chairman of each of the Sections mentioned to appoint annually a Committee of Award, consisting of three experts, who shall carefully examine the essays offered for competition, and, if any one shall be found worthy of the prize as a substantial contribution to medical knowledge, to recommend the same to the Association.

All essays placed by their authors for competition shall be in

the hands of the chairmen of the respective Committees of Award on or before the first day of January preceding the meeting of the Association at which the reports of the committees are required to be made.

All Prize Essays shall be considered as the property of the Association.

The names of the authors of the competing essays shall be kept secret from the committees by such means as the latter may provide.

Membership in either of the two committees shall not debar from membership in the other; nor shall membership in the Committee of Selection exclude a member from the privilege of offering a competing essay.

III.—STANDING COMMITTEES.

The following are the Standing Committees of the Association, to be filled by the Committee on Nominations, and to report at the next annual meeting subsequent to their appointment, viz.: Committee of Arrangements; Committee of Publication; and Committee on American Medical Necrology.

The *Committee of Publication* shall append to each volume of the *Transactions* hereafter published, a copy of the Constitution, By-Laws, and Code of Ethics of the Association. It shall print conspicuously, at the beginning of each volume of the *Transactions*, the following disclaimer, viz.: The American Medical Association, although formally accepting and publishing the reports of the various standing committees, holds itself wholly irresponsible for the opinions, theories, or criticisms therein contained, except when otherwise decided by special resolution.

The *Committee on American Medical Necrology* shall consist of one member for each State and Territory represented in the Association, whose duty it shall be to procure memorials of the eminent and worthy dead among the distinguished physicians of their respective States and Territories, and transmit them to the chairman of this committee on or before the first of April of each and every year.

IV.—THE PUBLICATION OF PAPERS AND REPORTS.

No report or other paper shall be entitled to publication in the volume for the year in which it shall be presented to the Association, unless it be placed in the hands of the Committee of Publication

on or before the first day of July. It must also be so prepared as to require no material alteration or addition at the hands of its author.

Authors of papers are required to return their proofs within two weeks after their reception; otherwise they will be passed over and omitted from the volume.

Every paper received by this Association and ordered to be published, and all plates or other means of illustration, shall be considered the exclusive property of the Association, and shall be published and sold for the exclusive benefit of the Association.

The Committee of Publication shall have full discretionary power to omit from the published *Transactions*, in part or in whole, any paper that may be referred to it by the Association, or either of the Sections, unless specially instructed to the contrary by vote of the Association.

V.—ASSESSMENTS.

The sum of five dollars shall be assessed, annually, upon each delegate to the sessions of the Association, as well as upon each of its permanent members, whether attending or not, for the purpose of raising a fund to defray necessary expenses. The payment of this sum shall be required of the delegates and members in attendance upon the sessions of the Association previously to their taking their seats and participating in the business of the sessions. Permanent members, not in attendance, shall transmit their dues to the Treasurer.

Any permanent member who shall fail to pay his annual dues for three successive years, unless absent from the country, shall be dropped from the roll of permanent members, after having been notified by the Secretary of the forfeiture of his membership.

VI.—DELEGATES FROM THE MEDICAL STAFFS OF THE ARMY AND NAVY.

Delegates representing the medical staffs of the United States Army and Navy, shall be appointed by the Chiefs of the Army and Navy Medical Bureaus. The number of delegates so appointed shall be four from the army medical officers, and an equal number from the navy medical officers.

VII.—DELEGATES TO FOREIGN MEDICAL SOCIETIES.

The President shall be authorized annually to appoint delegates to represent this Association at the meetings of the British Medical

Association, the American Medical Society at Paris, and such other scientific bodies in Europe or other foreign countries as may be affiliated with us.

VIII.—DUTIES OF MEMBERS.

No one shall be permitted to address the Association, except he shall have first given his name and residence, which shall be distinctly announced from the chair, and the member may be required to go forward and speak from the stand, but not more than ten minutes at one time.

No one appointed on a special committee, who fails to report at the meeting next succeeding the one at which he is appointed, shall be continued on such committee, or appointed on any other, unless a satisfactory excuse is offered.

IX.—CONDITION EXCLUDING REPRESENTATION.

No State or Local Medical Society, or other organized institution, shall be entitled to representation in this Association that has not adopted its Code of Ethics; or that has intentionally violated or disregarded any article or clause of the same.

X.—OF THE PREVIOUS QUESTION.

When the previous question is demanded, it shall take at least twenty members to second it; and when the main question is put under force of the previous question and negatived, the question shall remain under consideration the same as if the previous question had not been enforced.

XI.—JUDICIAL COUNCIL.

A council, consisting of twenty-one members, shall be appointed by the Nominating Committee, whose duty it shall be to take cognizance of, and decide, all questions of an ethical or judicial character that may arise in connection with the Association. Of the twenty-one members of the council first appointed the seven first named on the list shall hold office one year, and the second seven named shall hold office two years.

With these exceptions the term of office of members of the council shall be three years, seven being appointed by the Nominating Committee annually.

The said council shall organize by choosing a President and

Secretary, and shall keep a permanent record of its proceedings. The decisions of said council on all matters referred to it by the Association shall be final, and shall be reported to the Association at the earliest practical moment.

All questions of a personal character, including complaints and protests, and all questions on credentials, shall be referred at once, after the report of the Committee of Arrangements or other presentation, to the *Judicial Council*, and without discussion.

XII.—NEW BUSINESS.

No new business, resolutions by members, etc., shall be introduced at the general session of the Association except on the first and fourth days of meetings.

ORDINANCES.

Resolved, That the several Sections of this Association be requested, in the future, to refer no papers or reports to the Committee of Publication, except such as can be fairly classed under one of the three following heads, viz: 1st. Such as may contain and establish *positively* new facts, modes of practice, or principles of real value. 2d. Such as may contain the results of well-devised original experimental researches. 3d. Such as present so complete a review of the facts on any particular subject as to enable the writer to deduce therefrom legitimate conclusions of importance.

Resolved, That the several sections be requested, in the future, to refer all such papers as may be presented to them for examination by this Association, that contain matter of more or less value, and yet cannot be fairly ranked under either of the heads mentioned in the foregoing resolution, back to their authors with the recommendation that they be published in such regular medical periodicals as said authors may select, with the privilege of placing at the head of such papers, "Read to the   Section of the American Medical Association on the   day of   18   ." (Vide *Transactions*, vol. xvi. p. 40.)

Resolved, That, instead of yearly reprinting the list of members of the American Medical Association, the Committee of Publication be instructed to prepare and print in the *Transactions* an alphabetical catalogue triennially, containing a complete list of the Permanent Members, with their names in full, designating their

residences, the year of their admission, the offices they may have held in the Association, and, in case of death or rejection, the date thereof. (Vide *Transactions*, vol. xvii. p. 33.)

Resolved, That no report or other paper shall be presented to this Association unless it be so prepared that it can be put at once into the hands of the Permanent Secretary, to be transmitted to the Committee of Publication. (Vide *Transactions*, vol. xvii. p. 27.)

Resolved, That the Permanent Secretary hereafter and from this date be authorized to draw a warrant upon the Treasurer for the expenses incurred in his attendance upon each session of the Association, and that the Treasurer is hereby instructed to pay the same. (Vide *Transactions*, vol. xviii. p. 42.)

Resolved, That the faculties of the several medical colleges of the United States be recommended to announce explicitly in their annual commencement circulars and advertisements that they will not receive certificates of time of study from irregular practitioners, and that they will not confer the degree upon any one who may acknowledge his intention to practise in accordance with any exclusive system. (Vide *Transactions*, vol. xix. p. 31.)

Resolved, That those gentlemen who desire to report on special subjects, and will pledge themselves to report at the next meeting, be requested to send their names, and the subjects on which they desire to report, to the Permanent Secretary. (Vide *Transactions*, vol. xix. p. 42.)

Resolved, That hereafter the necessary expenses for rent of hall for general meetings and rooms for sections to accommodate the annual meetings, and the necessary expenses for cards of membership, be paid out of the treasury of the Association. (Vide *Transactions*, vol. xix. p. 42.)

Resolved, That each State Medical Society be requested to prepare an annual register of all the regular practitioners of medicine in their respective States, giving the names of the colleges in which they may have graduated, and date of diploma or license. (Vide *Transactions*, vol. xx. p. 20.)

Resolved, That this Association recognizes specialties as proper and legitimate fields of practice.

Resolved, That specialists shall be governed by the same rules of professional etiquette as have been laid down for general practitioners.

Resolved, That it shall not be proper for specialists publicly to

advertise themselves such, or to assume any title not specially granted by a regularly chartered college.

Resolved, That private handbills addressed to members of the medical profession, or by cards in medical journals, calling the attention of professional brethren to themselves as specialists, be declared in violation of the Code of Ethics of the American Medical Association. (Vide *Transactions*, vol. xx. p. 28.)

Resolved, That a Committee of one be appointed, residing at Washington, to render the Librarian of Congress such assistance as the interests of the Association may require. (Vide *Transactions*, vol. xx. p. 29.)

Whereas, The proper construction of Art. IV., Sec. 1, Code of Ethics, A. M. A., having been called for, relative to consultation with irregular practitioners who are graduates of regular schools.

Resolved, That said Art. IV., Sect. 1, Code of Ethics, excludes all such practitioners from recognition by the regular profession. (Vide *Transactions*, vol. xx. p. 30.)

Resolved, That if any member fail to reply for more than one year to the circular sent to him by the Committee of Publication, he shall forfeit his right to the volume, and it shall revert to the Association, to be sold to any applicant at the current rates. (Vide *Transactions*, vol. xxi. p. 30.)

Resolved, That the Committee of Arrangements for the next ensuing meeting of this Association, and for all meetings thereafter, be directed to prepare a list of members present on a separate roll, for convenience and accuracy in calling the ayes and nays when the same shall be demanded. (Vide *Transactions*, vol. xxi. p. 60.)

Resolved, That each year, until otherwise ordered, the President elect and the Permanent Secretary be directed to appeal, in the name of the Association, to the authorities of each State where no State Board of Health exists, urging them to establish such boards. (Vide *Transactions*, vol. xxvi. p. 50.)

Resolved, That the Permanent Secretary is hereby directed annually to report the names of States where boards of health exist, and also of those which decline to establish them; said report to form a part of the annual proceedings of the Association. (Vide *Transactions*, vol. xxvi. p. 50.)

Resolved, That members of the medical profession who in any way aid or abet the graduation of medical students in irregular or exclusive systems of medicine, are deemed thereby to violate the

spirit of the ethics of the American Medical Association. (Vide *Transactions*, vol. xxvii. p. 48.)

Resolved, 1. That the American Medical Association adopts the International Metric System, and will use it in its Transactions. (Vide *Transactions*, vol. xxx. p. 44.)

2. Requests that those who present papers at its future meetings employ this system in their communications, or reprints thereof. (Vide *Transactions*, vol. xxx. p. 44.)

3. Requests the medical boards of the hospitals and dispensaries to adopt the Metric System in prescribing and recording cases; and that the Faculties of the medical and pharmaceutic schools adopt it in their didactic, clinical, or dispensing departments. (Vide *Transactions*, vol. xxx. p. 44.)

Resolved, That the President and Secretary of this Association are directed to annually petition Congress to enact a law which shall permit every person engaged in a scientific pursuit to import for his own use, free of duty, any one book or instrument appertaining to his special pursuit. (Vide *Transactions*, vol. xxx. p. 45.)

Resolved, That the above-named officers are further directed to urge the State Medical Societies and their auxiliary branches to aid this Association in accomplishing this purpose, by petitions to Congress, and by otherwise influencing Congressmen. (Vide *Transactions*, vol. xxx. p. 45.)

Decision by Judicial Council: A gentleman who is not in affiliation with a County, District, or State Medical Society, where such organizations exist, is *not* entitled to be registered as a permanent member upon the claim of having been a delegate from a body not now entitled to representation in this body. (Vide *Transactions*, vol. xxx. p. 57.)

CODE OF ETHICS

OF THE

AMERICAN MEDICAL ASSOCIATION,

ADOPTED MAY, 1847.

CODE OF MEDICAL ETHICS.

OF THE DUTIES OF PHYSICIANS TO THEIR PATIENTS, AND OF THE OBLIGATIONS OF PATIENTS TO THEIR PHYSICIANS.

ART. I.—*Duties of physicians to their patients.*

§ 1. A physician should not only be ever ready to obey the calls of the sick, but his mind ought also to be imbued with the greatness of his mission, and the responsibility he habitually incurs in its discharge. These obligations are the more deep and enduring, because there is no tribunal other than his own conscience to adjudge penalties for carelessness or neglect. Physicians should, therefore, minister to the sick with due impressions of the importance of their office; reflecting that the ease, the health, and the lives of those committed to their charge, depend on their skill, attention, and fidelity. They should study, also, in their deportment, so to unite *tenderness* with *firmness*, and *condescension* with *authority*, as to inspire the minds of their patients with gratitude, respect, and confidence.

§ 2. Every case committed to the charge of a physician should be treated with attention, steadiness, and humanity. Reasonable indulgence should be granted to the mental imbecility and caprices of the sick. Secrecy and delicacy, when required by peculiar circumstances, should be strictly observed; and the familiar and confidential intercourse to which physicians are admitted in their professional visits, should be used with discretion, and with the most scrupulous regard to fidelity and honor. The obligation of secrecy extends beyond the period of professional services;—none of the privacies of personal and domestic life, no infirmity of disposition or flaw of character observed during professional attendance should ever be divulged by the physician except when he is imperatively required to do so. The force and necessity of this obligation are indeed so great, that professional men have, under

certain circumstances, been protected in their observance of secrecy by courts of justice.

§ 3. Frequent visits to the sick are in general requisite, since they enable the physician to arrive at a more perfect knowledge of the disease—to meet promptly every change which may occur, and also tend to preserve the confidence of the patient. But unnecessary visits are to be avoided, as they give useless anxiety to the patient, tend to diminish the authority of the physician, and render him liable to be suspected of interested motives.

§ 4. A physician should not be forward to make gloomy prognostications, because they savor of empiricism, by magnifying the importance of his services in the treatment or cure of the disease. But he should not fail, on proper occasions, to give to the friends of the patient timely notice of danger when it really occurs; and even to the patient himself, if absolutely necessary. This office, however, is so peculiarly alarming when executed by him, that it ought to be declined whenever it can be assigned to any other person of sufficient judgment and delicacy. For the physician should be the minister of hope and comfort to the sick; that, by such cordials to the drooping spirit, he may smooth the bed of death, revive expiring life, and counteract the depressing influence of those maladies which often disturb the tranquillity of the most resigned in their last moments. The life of a sick person can be shortened not only by the acts, but also by the words or the manner of a physician. It is, therefore, a sacred duty to guard himself carefully in this respect, and to avoid all things which have a tendency to discourage the patient and to depress his spirits.

§ 5. A physician ought not to abandon a patient because the case is deemed incurable; for his attendance may continue to be highly useful to the patient, and comforting to the relatives around him, even in the last period of a fatal malady, by alleviating pain and other symptoms, and by soothing mental anguish. To decline attendance, under such circumstances, would be sacrificing to fanciful delicacy and mistaken liberality, that moral duty, which is independent of, and far superior to, all pecuniary consideration.

§ 6. Consultations should be promoted in difficult or protracted cases, as they give rise to confidence, energy, and more enlarged views in practice.

§ 7. The opportunity which a physician not unfrequently enjoys of promoting and strengthening the good resolutions of his patients, suffering under the consequences of vicious conduct, ought never

to be neglected. His counsels, or even remonstrances, will give satisfaction, not offence, if they be proffered with politeness, and evince a genuine love of virtue, accompanied by a sincere interest in the welfare of the person to whom they are addressed.

ART. II.—*Obligations of patients to their physicians.*

§ 1. The members of the medical profession, upon whom is enjoined the performance of so many important and arduous duties towards the community, and who are required to make so many sacrifices of comfort, ease, and health, for the welfare of those who avail themselves of their services, certainly have a right to expect and require, that their patients should entertain a just sense of the duties which they owe to their medical attendants.

§ 2. The first duty of a patient is to select as his medical adviser one who has received a regular professional education. In no trade or occupation do mankind rely on the skill of an untaught artist; and in medicine, confessedly the most difficult and intricate of the sciences, the world ought not to suppose that knowledge is intuitive.

§ 3. Patients should prefer a physician whose habits of life are regular, and who is not devoted to company, pleasure, or to any pursuit incompatible with his professional obligations. A patient should, also, confide the care of himself and family, as much as possible, to one physician; for a medical man who has become acquainted with the peculiarities of constitution, habits, and predispositions of those he attends, is more likely to be successful in his treatment than one who does not possess that knowledge.

A patient who has thus selected his physician should always apply for advice in what may appear to him trivial cases, for the most fatal results often supervene on the slightest accidents. It is of still more importance that he should apply for assistance in the forming stage of violent diseases; it is to a neglect of this precept that medicine owes much of the uncertainty and imperfection with which it has been reproached.

§ 4. Patients should faithfully and unreservedly communicate to their physician the supposed cause of their disease. This is the more important, as many diseases of a mental origin simulate those depending on external causes, and yet are only to be cured by ministering to the mind diseased. A patient should never be afraid of thus making his physician his friend and adviser; he should always

bear in mind that a medical man is under the strongest obligations of secrecy. Even the female sex should never allow feelings of shame or delicacy to prevent their disclosing the seat, symptoms, and causes of complaints peculiar to them. However commendable a modest reserve may be in the common occurrences of life, its strict observance in medicine is often attended with the most serious consequences, and a patient may sink under a painful and loathsome disease, which might have been readily prevented had timely intimation been given to the physician.

§ 5. A patient should never weary his physician with a tedious detail of events or matters not appertaining to his disease. Even as relates to his actual symptoms, he will convey much more real information by giving clear answers to interrogatories, than by the most minute account of his own framing. Neither should he obtrude upon his physician the details of his business nor the history of his family concerns.

§ 6. The obedience of a patient to the prescriptions of his physician should be prompt and implicit. He should never permit his own crude opinions as to their fitness to influence his attention to them. A failure in one particular may render an otherwise judicious treatment dangerous, and even fatal. This remark is equally applicable to diet, drink, and exercise. As patients become convalescent, they are very apt to suppose that the rules prescribed for them may be disregarded, and the consequence, but too often, is a relapse. Patients should never allow themselves to be persuaded to take any medicine whatever, that may be recommended to them by the self-constituted doctors and doctresses who are so frequently met with, and who pretend to possess infallible remedies for the cure of every disease. However simple some of their prescriptions may appear to be, it often happens that they are productive of much mischief, and in all cases they are injurious, by contravening the plan of treatment adopted by the physician.

§ 7. A patient should, if possible, avoid even the *friendly visits of a physician* who is not attending him—and when he does receive them, he should never converse on the subject of his disease, as an observation may be made, without any intention of interference, which may destroy his confidence in the course he is pursuing, and induce him to neglect the directions prescribed to him. A patient should never send for a consulting physician without the express consent of his own medical attendant. It is of great importance that physicians should act in concert; for, although their modes

of treatment may be attended with equal success when employed singly, yet conjointly they are very likely to be productive of disastrous results.

§ 8. When a patient wishes to dismiss his physician, justice and common courtesy require that he should declare his reasons for so doing.

§ 9. Patients should always, when practicable, send for their physician in the morning, before his usual hour of going out; for, by being early aware of the visits he has to pay during the day, the physician is able to apportion his time in such a manner as to prevent an interference of engagements. Patients should also avoid calling on their medical adviser unnecessarily during the hours devoted to meals or sleep. They should always be in readiness to receive the visits of their physician, as the detention of a few minutes is often of serious inconvenience to him.

§ 10. A patient should, after his recovery, entertain a just and enduring sense of the value of the services rendered him by his physician; for these are of such a character, that no mere pecuniary acknowledgment can repay or cancel them.

OF THE DUTIES OF PHYSICIANS TO EACH OTHER, AND TO THE PROFESSION AT LARGE.

ART. I.—*Duties for the support of professional character.*

§ 1. Every individual, on entering the profession, as he becomes thereby entitled to all its privileges and immunities, incurs an obligation to exert his best abilities to maintain its dignity and honor, to exalt its standing, and to extend the bounds of its usefulness. He should, therefore, observe strictly such laws as are instituted for the government of its members; should avoid all contumelious and sarcastic remarks relative to the faculty as a body; and while, by unwearied diligence, he resorts to every honorable means of enriching the science, he should entertain a due respect for his seniors, who have, by their labors, brought it to the elevated condition in which he finds it.

§ 2. There is no profession, from the members of which greater purity of character, and a higher standard of moral excellence are required, than the medical; and to attain such eminence is a duty every physician owes alike to his profession and to his patients. It is due to the latter, as without it he cannot command their respect and confidence, and to both, because no scientific attainments can

compensate for the want of correct moral principles. It is also incumbent upon the faculty to be temperate in all things, for the practice of physic requires the unremitting exercise of a clear and vigorous understanding; and, on emergencies, for which no professional man should be unprepared, a steady hand, an acute eye, and an unclouded head mav be essential to the well-being, and even to the life, of a fellow-creature.

§ 3. It is derogatory to the dignity of the profession to resort to public advertisements, or private cards, or handbills, inviting the attention of individuals affected with particular diseases—publicly offering advice and medicine to the poor gratis, or promising radical cures; or to publish cases and operations in the daily prints, or suffer such publications to be made; to invite laymen to be present at operations, to boast of cures and remedies, to adduce certificates of skill and success, or to perform any other similar acts. These are the ordinary practices of empirics, and are highly reprehensible in a regular physician.

§ 4. Equally derogatory to professional character is it for a physician to hold a patent for any surgical instrument or medicine; or to dispense a secret *nostrum*, whether it be the composition or exclusive property of himself or of others. For, if such nostrum be of real efficacy, any concealment regarding it is inconsistent with beneficence and professional liberality; and if mystery alone give it value and importance, such craft implies either disgraceful ignorance or fraudulent avarice. It is also reprehensible for physicians to give certificates attesting the efficacy of patent or secret medicines, or in any way to promote the use of them.

Art. II.—*Professional services of physicians to each other.*

§ 1. All practitioners of medicine, their wives, and their children while under the paternal care, are entitled to the gratuitous services of any one or more of the faculty residing near them, whose assistance may be desired. A physician afflicted with disease is usually an incompetent judge of his own case; and the natural anxiety and solicitude which he experiences at the sickness of a wife, a child, or any one who, by the ties of consanguinity, is rendered peculiarly dear to him, tend to obscure his judgment, and produce timidity and irresolution in his practice. Under such circumstances, medical men are peculiarly dependent upon each other, and kind offices and professional aid should always be cheerfully

and gratuitously afforded. Visits ought not, however, to be obtruded officiously; as such unasked civility may give rise to embarrassment, or interfere with that choice on which confidence depends. But, if a distant member of the faculty, whose circumstances are affluent, request attendance, and an honorarium be offered, it should not be declined; for no pecuniary obligation ought to be imposed, which the party receiving it would wish not to incur.

ART. III.—*Of the duties of physicians as respects vicarious offices.*

§ 1. The affairs of life, the pursuit of health, and the various accidents and contingencies to which a medical man is peculiarly exposed, sometimes require him temporarily to withdraw from his duties to his patients, and to request some of his professional brethren to officiate for him. Compliance with this request is an act of courtesy, which should always be performed with the utmost consideration for the interest and character of the family physician, and when exercised for a short period, all the pecuniary obligations for such service should be awarded to him. But if a member of the profession neglect his business in quest of pleasure and amusement, he cannot be considered as entitled to the advantages of the frequent and long-continued exercise of this fraternal courtesy, without awarding to the physician who officiates, the fees arising from the discharge of his professional duties.

In obstetrical and important surgical cases, which give rise to unusual fatigue, anxiety, and responsibility, it is just that the fees accruing therefrom should be awarded to the physician who officiates.

ART. IV.—*Of the duties of physicians in regard to consultations.*

§ 1. A regular medical education furnishes the only presumptive evidence of professional abilities and acquirements, and ought to be the only acknowledged right of an individual to the exercise and honors of his profession. Nevertheless, as in consultations the good of the patient is the sole object in view and this is often dependent on personal confidence, no intelligent regular practitioner, who has a license to practise from some medical board of known and acknowledged respectability, recognized by this Association, and who is in good moral and professional standing in the place in which he resides, should be fastidiously excluded from fellow-

ship, or his aid refused in consultation, when it is requested by the patient. But no one can be considered as a regular practitioner or a fit associate in consultation, whose practice is based on an exclusive dogma, to the rejection of the accumulated experience of the profession, and of the aids actually furnished by anatomy, physiology, pathology, and organic chemistry.

§ 2. In consultations, no rivalship or jealousy should be indulged; candor, probity, and all due respect should be exercised towards the physician having charge of the case.

§ 3. In consultations, the attending physician should be the first to propose the necessary questions to the sick; after which the consulting physician should have the opportunity to make such further inquiries of the patient as may be necessary to satisfy him of the true character of the case. Both physicians should then retire to a private place for deliberation; and the one first in attendance should communicate the directions agreed upon to the patient or his friends, as well as any opinions which it may be thought proper to express. But no statement or discussion of it should take place before the patient or his friends, except in the presence of all the faculty attending, and by their common consent; and no *opinions* or *prognostications* should be delivered which are not the result of previous deliberation and concurrence.

§ 4. In consultations, the physician in attendance should deliver his opinion first; and when there are several consulting, they should deliver their opinions in the order in which they have been called in. No decision, however, should restrain the attending physician from making such variations in the mode of treatment as any subsequent unexpected change in the character of the case may demand. But such variation, and the reasons for it, ought to be carefully detailed at the next meeting in consultation. The same privilege belongs also to the consulting physician if he is sent for in an emergency, when the regular attendant is out of the way, and similar explanations must be made by him at the next consultation.

§ 5. The utmost punctuality should be observed in the visits of physicians when they are to hold consultation together, and this is generally practicable, for society has been considerate enough to allow the plea of a professional engagement to take precedence of all others, and to be an ample reason for the relinquishment of any present occupation. But as professional engagements may sometimes interfere, and delay one of the parties, the physician who first arrives should wait for his associate a reasonable period, after

which the consultation should be considered as postponed to a new appointment. If it be the attending physician who is present, he will of course see the patient and prescribe; but if it be the consulting one, he should retire, except in case of emergency, or when he has been called from a considerable distance, in which latter case he may examine the patient, and give his opinion in *writing*, and *under seal*, to be delivered to his associate.

§ 6. In consultations, theoretical discussions should be avoided, as occasioning perplexity and loss of time. For there may be much diversity of opinion concerning speculative points, with perfect agreement in those modes of practice which are founded, not on hypothesis, but on experience and observation.

§ 7. All discussions in consultation should be held as secret and confidential. Neither by words nor manner should any of the parties to a consultation assert or insinuate that any part of the treatment pursued did not receive his assent. The responsibility must be equally divided between the medical attendants—they must equally share the credit of success as well as the blame of failure.

§ 8. Should an irreconcilable diversity of opinion occur when several physicians are called upon to consult together, the opinion of the majority should be considered as decisive; but if the numbers be equal on each side, then the decision should rest with the attending physician. It may, moreover, sometimes happen that two physicians cannot agree in their views of the nature of a case, and the treatment to be pursued. This is a circumstance much to be deplored, and should always be avoided, if possible, by mutual concessions, as far as they can be justified by a conscientious regard for the dictates of judgment. But in the event of its occurrence, a third physician should, if practicable, be called to act as umpire; and, if circumstances prevent the adoption of this course, it must be left to the patient to select the physician in whom he is most willing to confide. But, as every physician relies upon the rectitude of his judgment, he should, when left in the minority, politely and consistently retire from any further deliberation in the consultation, or participation in the management of the case.

§ 9. As circumstances sometimes occur to render a *special consultation* desirable, when the continued attendance of two physicians might be objectionable to the patient, the member of the faculty whose assistance is required in such cases should sedulously guard against all future unsolicited attendance. As such consultations

require an extraordinary portion both of time and attention, at least a double honorarium may be reasonably expected.

§ 10. A physician who is called upon to consult, should observe the most honorable and scrupulous regard for the character and standing of the practitioner in attendance; the practice of the latter, if necessary, should be justified as far as it can be, consistently with a conscientious regard for truth, and no hint or insinuation should be thrown out which could impair the confidence reposed in him, or affect his reputation. The consulting physician should also carefully refrain from any of those extraordinary attentions or assiduities which are too often practised by the dishonest for the base purpose of gaining applause, or ingratiating themselves into the favor of families and individuals.

ART. V.—*Duties of physicians in cases of interference.*

§ 1. Medicine is a liberal profession, and those admitted into its ranks should found their expectations of practice upon the extent of their qualifications, not on intrigue or artifice.

§ 2. A physician, in his intercourse with a patient under the care of another practitioner, should observe the strictest caution and reserve. No meddling inquiries should be made—no disingenuous hints given relative to the nature and treatment of his disorder; nor any course of conduct pursued that may directly or indirectly tend to diminish the trust reposed in the physician employed.

§ 3. The same circumspection and reserve should be observed when, from motives of business or friendship, a physician is prompted to visit an individual who is under the direction of another practitioner. Indeed, such visits should be avoided, except under peculiar circumstances; and when they are made, no particular inquiries should be instituted relative to the nature of the disease, or the remedies employed, but the topics of conversation should be as foreign to the case as circumstances will admit.

§ 4. A physician ought not to take charge of or prescribe for a patient who has recently been under the care of another member of the faculty in the same illness, except in cases of sudden emergency, or in consultation with the physician previously in attendance, or when the latter has relinquished the case, or been regularly notified that his services are no longer desired. Under such circumstances, no unjust and illiberal insinuations should be thrown out in relation to the conduct or practice previously pursued, which should

be justified as far as candor and regard for truth and probity will permit; for it often happens that patients become dissatisfied when they do not experience immediate relief, and, as many diseases are naturally protracted, the want of success, in the first stage of treatment, affords no evidence of a lack of professional knowledge and skill.

§ 5. When a physician is called to an urgent case, because the family attendant is not at hand, he ought, unless his assistance in consultation be desired, to resign the care of the patient to the latter immediately on his arrival.

§ 6. It often happens in cases of sudden illness, or of recent accidents and injuries, owing to the alarm and anxiety of friends, that a number of physicians are simultaneously sent for. Under these circumstances, courtesy should assign the patient to the first who arrives, who should select from those present any additional assistance that he may deem necessary. In all such cases, however, the practitioner who officiates should request the family physician, if there be one, to be called, and, unless his further attendance be requested, should resign the case to the latter on his arrival.

§ 7. When a physician is called to the patient of another practitioner, in consequence of the sickness or absence of the latter, he ought, on the return or recovery of the regular attendant and with the consent of the patient, to surrender the case.

[The expression, "patient of another practitioner," is understood to mean a patient who may have been under the charge of another practitioner at the time of the attack of sickness, or departure from home of the latter, or who may have called for his attendance during his absence or sickness, or in any other manner given it to be understood that he regarded the said physician as his regular medical attendant.]

§ 8. A physician, when visiting a sick person in the country, may be desired to see a neighboring patient who is under the regular direction of another physician, in consequence of some sudden change or aggravation of symptoms. The conduct to be pursued on such an occasion is to give advice adapted to present circumstances; to interfere no further than is absolutely necessary with the general plan of treatment; to assume no future direction unless it be expressly desired; and, in this last case, to request an immediate consultation with the practitioner previously employed.

§ 9. A wealthy physician should not give advice *gratis* to the affluent; because his doing so is an injury to his professional breth-

ren. The office of a physician can never be supported as an exclusively beneficent one; and it is defrauding, in some degree, the common funds for its support, when fees are dispensed with which might justly be claimed.

§ 10. When a physician who has been engaged to attend a case of midwifery is absent, and another is sent for, if delivery is accomplished during the attendance of the latter, he is entitled to the fee, but should resign the patient to the practitioner first engaged.

Art. VI.—*Of differences between physicians.*

§ 1. Diversity of opinion and opposition of interest may, in the medical as in other professions, sometimes occasion controversy and even contention. Whenever such cases unfortunately occur, and cannot be immediately terminated, they should be referred to the arbitration of a sufficient number of physicians or a *court-medical.*

§ 2. As peculiar reserve must be maintained by physicians towards the public, in regard to professional matters, and as there exist numerous points in medical ethics and etiquette through which the feelings of medical men may be painfully assailed in their intercourse with each other, and which cannot be understood or appreciated by general society, neither the subject-matter of such differences nor the adjudication of the arbitrators should be made public, as publicity in a case of this nature may be personally injurious to the individuals concerned, and can hardly fail to bring discredit on the faculty.

Art. VII.—*Of pecuniary acknowledgments.*

Some general rules should be adopted by the faculty, in every town or district, relative to *pecuniary acknowledgments* from their patients; and it should be deemed a point of honor to adhere to these rules with as much uniformity as varying circumstances will admit.

OF THE DUTIES OF THE PROFESSION TO THE PUBLIC, AND OF THE OBLIGATIONS OF THE PUBLIC TO THE PROFESSION.

Art. I.—*Duties of the profession to the public.*

§ 1. As good citizens, it is the duty of physicians to be ever vigilant for the welfare of the community, and to bear their part in sustaining its institutions and burdens; they should also be ever

ready to give counsel to the public in relation to matters especially appertaining to their profession, as on subjects of medical police, public hygiene, and legal medicine. It is their province to enlighten the public in regard to quarantine regulations; the location, arrangement, and dietaries of hospitals, asylums, schools, prisons, and similar institutions; in relation to the medical police of towns, as drainage, ventilation, etc.; and in regard to measures for the prevention of epidemic and contagious diseases; and when pestilence prevails, it is their duty to face the danger, and to continue their labors for the alleviation of the suffering, even at the jeopardy of their own lives.

§ 2. Medical men should also be always ready, when called on by the legally constituted authorities, to enlighten coroners' inquests and courts of justice, on subjects strictly medical—such as involve questions relating to sanity, legitimacy, murder by poisons or other violent means, and in regard to the various other subjects embraced in the science of Medical Jurisprudence. But in these cases, and especially where they are required to make a *post-mortem* examination, it is just, in consequence of the time, labor, and skill required, and the responsibility and risk they incur, that the public should award them a proper honorarium.

§ 3. There is no profession by the members of which eleemosynary services are more liberally dispensed than the medical, but justice requires that some limits should be placed to the performance of such good offices. Poverty, professional brotherhood, and certain of the public duties referred to in the first section of this article, should always be recognized as presenting valid claims for gratuitous services; but neither institutions endowed by the public or by rich individuals, societies for mutual benefit, for the insurance of lives or for analogous purposes, nor any profession or occupation, can be admitted to possess such privilege. Nor can it be justly expected of physicians to furnish certificates of inability to serve on juries, to perform militia duty, or to testify to the state of health of persons wishing to insure their lives, obtain pensions, or the like, without a pecuniary acknowledgment. But to individuals in indigent circumstances, such professional services should always be cheerfully and freely accorded.

§ 4. It is the duty of physicians, who are frequent witnesses of the enormities committed by quackery, and the injury to health and even destruction of life caused by the use of quack medicines, to enlighten the public on these subjects, to expose the injuries

sustained by the unwary from the devices and pretensions of artful empirics and impostors. Physicians ought to use all the influence which they may possess, as professors in Colleges of Pharmacy, and by exercising their option in regard to the shops to which their prescriptions shall be sent, to discourage druggists and apothecaries from vending quack or secret medicines, or from being in any way engaged in their manufacture and sale.

Art. II.—*Obligations of the public to physicians.*

§ 1. The benefits accruing to the public, directly and indirectly, from the active and unwearied beneficence of the profession, are so numerous and important, that physicians are justly entitled to the utmost consideration and respect from the community. The public ought likewise to entertain a just appreciation of medical qualifications; to make a proper discrimination between true science and the assumptions of ignorance and empiricism; to afford every encouragement and facility for the acquisition of medical education —and no longer to allow the statute-books to exhibit the anomaly of exacting knowledge from physicians, under a liability to heavy penalties, and of making them obnoxious to punishment for resorting to the only means of obtaining it.

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OF THE

AMERICAN MEDICAL ASSOCIATION.

CATALOGUE OF THE OFFICERS

OF THE

AMERICAN MEDICAL ASSOCIATION.

PRESIDENTS AND VICE-PRESIDENTS OF THE AMERICAN MEDICAL ASSOCIATION.

1847-48.

PHILADELPHIA.

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VICE-PRESIDENTS.

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Alexander H. Stevens, M.D., *New York.*
James Moultrie, M.D., *South Carolina.*
A. H. Buchanan, M.D., *Tennessee.*

1848-49.

BALTIMORE.

PRESIDENT.

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VICE-PRESIDENTS.

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Samuel Jackson, M.D., *Pennsylvania.*
Paul F. Eve, M.D., *Georgia.*
W. M. Awl, M.D., *Ohio.*

1849-50.

BOSTON.

PRESIDENT.

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VICE-PRESIDENTS.

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Hugh H. Maguire, M.D., *Virginia.*
R. S. Stewart, M.D., *Maryland.*

1850-51.

CINCINNATI.

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Reuben D. Mussey, M.D., *Ohio.*

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A. Lopez, M.D., *Alabama.*
George W. Norris, M.D., *Pennsylvania.*

1851-52.

CHARLESTON.

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R. D. Arnold, M.D., *Georgia.*
J. B. Flint, M.D., *Kentucky.*

1852-53.

RICHMOND.

PRESIDENT.

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James W. Thomson, M.D., *Delaware.*
C. A. Pope, M.D., *Missouri.*

1853-54.

NEW YORK.

PRESIDENT.

JONATHAN KNIGHT, M. D., *Connecticut.*

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LEWIS CONDICT, M. D., *New Jersey.*
HENRY R. FROST, M. D., *South Carolina.*
R. L. HOWARD, M. D., *Ohio.*

1854-55.

ST. LOUIS.

PRESIDENT.

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N. S. DAVIS, M. D., *Illinois.*
WM. WRAGG, M. D., *South Carolina.*
JOHN GREEN, M. D., *Massachusetts.*

1855-56.

PHILADELPHIA.

PRESIDENT.

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DANIEL TILDEN, M. D., *Ohio.*
D. HUMPHREYS STORER, M. D., *Massachusetts.*
GRAFTON TYLER, M. D., *District of Columbia.*

1856-57.

DETROIT.

PRESIDENT.

ZINA PITCHER, M. D., *Michigan.*

VICE-PRESIDENTS.

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E. GEDDINGS, M. D., *South Carolina.*
WM. K. BOWLING, M. D., *Tennessee.*
W. H. BRISBANE, M. D., *Wisconsin.*

1857-58.

NASHVILLE.

PRESIDENT.

Paul F. Eve, M. D., *Tennessee.*

VICE-PRESIDENTS.

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D. M. Reese, M. D., *New York.*
Henry F. Campbell, M. D., *Georgia.*

1858-59.

WASHINGTON.

PRESIDENT.

Harvey Lindsley, M. D., *District of Columbia.*

VICE-PRESIDENTS.

W. L. Sutton, M. D., *Kentucky.*
Josiah Crosby, M. D., *New Hampshire.*
Thomas O. Edwards, M. D., *Iowa.*
W. C. Warren, M. D., *North Carolina.*

1859-60.

LOUISVILLE.

PRESIDENT.

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VICE-PRESIDENTS.

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Lyndon A. Smith, M. D., *New Jersey.*
Charles S. Tripler, M. D., *United States Army.*
Calvin West, M. D., *Indiana.*

1860-63.

NEW HAVEN.

PRESIDENT.

Eli Ives, M. D., *Connecticut.*

VICE-PRESIDENTS.

Wilson Jewell, M. D., *Pennsylvania.*
Joseph A. Logan, M. D., *Georgia.*
A. B. Palmer, M. D., *Michigan.*
Joseph N. McDowell, M. D., *Missouri.*

1863-64.

CHICAGO.

PRESIDENT.

ALDEN MARCH, M. D., *New York.*

VICE-PRESIDENTS.

JAMES COUPER, M. D., *Delaware.*
DAVID PRINCE, M. D., *Illinois.*
CHRISTOPHER C. COX, M. D., *Maryland.*
EZRA S. CARR, M. D., *Wisconsin.*

1864.

NEW YORK.

PRESIDENT.

NATHAN S. DAVIS, M. D., *Illinois.*

VICE-PRESIDENTS.

W. H. MUSSEY, M. D., *Ohio.*
WORTHINGTON HOOKER, M. D., *Connecticut.*
WILLIAM WHELAN, M. D., *District of Columbia.*
F. E. B. HEINTZE, M. D., *Maryland.*

1865.

BOSTON.

The Constitution having been amended, the same officers presided also at Boston. (Vide *Transactions,* vol. xv. p. 50.)

1866.

BALTIMORE.

PRESIDENT.

D. HUMPHREYS STORER, M. D., *Massachusetts.*

VICE-PRESIDENTS.

JAMES F. HIBBERD, M. D., *Indiana.*
STEPHEN O. ALMY, M. D., *Ohio.*
THEOPHILUS C. DUNN, M. D., *Rhode Island.*
W. P. JOHNSON, M. D., *District of Columbia.*

1867.

CINCINNATI.

PRESIDENT.

HENRY F. ASKEW, M. D., *Delaware.*

VICE-PRESIDENTS.

WILLIAM K. BOWLING, M. D., *Tennessee.*
J. C. HUGHES, M. D., *Iowa.*
H. I. BOWDITCH, M. D., *Massachusetts.*
THOMAS C. BRINSMADE, M. D., *New York.*

1868.

WASHINGTON.

PRESIDENT.

SAMUEL D. GROSS, M. D., *Pennsylvania.*

VICE-PRESIDENTS.

ALFRED C. POST, M. D., *New York.*
JOHN L. ATLEE, M. D., *Pennsylvania.*
DAVID W. YANDELL, M. D., *Kentucky.*
HORATIO ROBINSON STORER, M. D., *Massachusetts.*

1869.

NEW ORLEANS.

PRESIDENT.

WILLIAM O. BALDWIN, M. D., *Alabama.*

VICE-PRESIDENTS.

GEORGE MENDENHALL, M. D., *Ohio.*
NOBLE YOUNG, M. D., *District of Columbia.*
N. P. MONROE, M. D., *Maine.*
S. M. BEMISS, M. D., *Louisiana.*

1870.

WASHINGTON.

PRESIDENT.

GEORGE MENDENHALL, M. D., *Ohio.*

VICE-PRESIDENTS.

WARREN STONE, M. D., *Louisiana.*
LOUIS A. SAYRE, M. D., *New York.*
F. GURNEY SMITH, M. D., *Pennsylvania.*
JOHN S. MOORE, M. D., *Missouri.*

1871.

SAN FRANCISCO.

PRESIDENT.

ALFRED STILLÉ, M.D., *Pennsylvania.*

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J. S. WETHERLY, M.D., *Alabama.*
HENRY GIBBONS, M.D., *California.*
T. J. HEARD, M.D., *Texas.*
SAMUEL WILLEY, M.D., *Minnesota.*

1872.

PHILADELPHIA.

PRESIDENT.

D. W. YANDELL, M.D., *Kentucky.*

VICE-PRESIDENTS.

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CHARLES L. IVES, M.D., *Connecticut.*
R. F. MICHEL, M.D., *Alabama.*
J. K. BARTLETT, M.D., *Wisconsin.*

1873.

ST. LOUIS.

PRESIDENT.

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W. M. MCPHEETERS, M.D., *Missouri.*
A. M. POLLOCK, M.D., *Pennsylvania.*
W. T. BRIGGS, M.D., *Tennessee.*

1874.

DETROIT.

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VICE-PRESIDENTS.

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L. F. WARNER, M.D., *Massachusetts.*

1875.

LOUISVILLE.

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H. W. BROWN, M.D., *Texas.*
H. D. DIDAMA, M.D., *New York.*

1876.

PHILADELPHIA.

PRESIDENT.

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VICE-PRESIDENTS.

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SAMUEL LILLY, M.D., *New Jersey.*
NINIAN PINKNEY, M.D., *United States Navy.*
S. D. SEELYE, M.D., *Alabama.*

1877.

CHICAGO.

PRESIDENT.

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VICE-PRESIDENTS.

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FRANKLIN STAPLES, M D., *Minnesota.*
JOSEPH R. SMITH, M.D., *United States Army.*
SAMUEL C. BUSEY, M.D., *District of Columbia.*

1878.

BUFFALO.

PRESIDENT.

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VICE-PRESIDENTS.

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MOSES GUNN, M.D., *Illinois.*
GEORGE W. RUSSELL, M.D., *Connecticut.*
A. DUNLAP, M.D., *Ohio.*

1879.

ATLANTA.

PRESIDENT.

THEOPHILUS PARVIN, M.D., *Indiana.*

VICE-PRESIDENTS.

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W. F. WESTMORELAND, M.D., *Georgia.*
JOHN MORRIS, M.D., *Maryland.*
JOHN H. MURPHY, M.D., *Minnesota.*

1880.

NEW YORK.

PRESIDENT.

LEWIS A. SAYRE, M.D., *New York.*

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H. O. MARCY, M.D., *Massachusetts.*
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INDEX.

LIST OF MEMBERS

OF THE

AMERICAN MEDICAL ASSOCIATION,

BY STATES,

FROM ITS FORMATION IN 1846 TO AND INCLUDING 1880.

COMPILED FROM THE ANNUAL PUBLISHED MINUTES.

BY

J. M. TONER, M.D.

LIST OF MEMBERS.

The years of attendance by each member are given and credited to the States from which he was a delegate, or registered as a Permanent Member, and is a register rather than a directory. The names of those known to be Deceased, and those who have Necrological Notices published in the *Transactions*, are marked.

EXPLANATION OF REFERENCES.

(d.)	Deceased, with the year.
(M.I.)	Member by invitation.
(E.P.M)	Elected by vote a Permanent Member.
(M.)	Name in Minutes but not in List of Members.
(*)	Biography of, in *Transactions*.
(O.)	Name in roll or list, but not in Minutes.
(X.)	Under some disqualification, or dropped from membership.
(C)	Delegate from a Society with membership from more than one State.
(?)	Some obscurity in the record.
P.	President.
V.P.	Vice President.
S.V.	Surgeon of United States Volunteers.

ALABAMA.

Abernethy, Robert Townes,	Tuscumbia, 1869.
Alexander, Abrm. F.	Eutaw, 1857.
Anderson, L. H.	Sumpterville, 1850. (d.)
Anderson, W. H.	Mobile, 1851, 80.
Bailey, E. H. C.	Demopolis, 1879.
Baker, Paul DeLacy,	Eufaula, 1879.
Baldwin, Wm. O.	Montgomery, 1868 P., 69, 72, 75, 79, 80.
Bankson, James S.	Stevenson, 1875. (d.)
Barclay, J. W.	Huntsville, 1876.
Bass, W. J., (M.I.)	Stevenson, 1857.
Berney, James,	Montgomery, 1869.
Bibb, W. G.	Montgomery, 1879.
Blakey, Boling A.	Montgomery, 1849. (d.)
Bledsoe, N. M.	Union Springs, 1879.
Boling, William M.	Montgomery, 1855 V.P. (d.)
Boseman, N., (M.I.)	Montgomery, 1858, 59, 66.
Butt, Richard L.	Medway, 1879.
Cabell, P. H.	Selma, 1855.
Cantwell, J. Y., (M.I.)	Decatur, 1868.
Clanton, S. W.	Warsaw, 1854, 55, 57. (d.)
Clark, John M. Worter,	Mount Hope, 1869.
Cochran, Jerome,	Mobile, 1869, 74.

Coleman, Ruffin, Athens, 1875.
Collier, Jas. Marshall, Troy, 1879, 80.
Collins, John L. Mobile, 1873. (d.)
Cook, John B., (M.I.) Mobile, 1857.
Coons, J. B. Courtland, 1859.
Cotnam, Thomas T., (M.I.) Stevenson, 1857.
Crampton, O. L. Mobile, 1872, 73.
Cross, Wm. C. Cherokee, 1875.
Crossley, Wm. A. Troy, 1879.
Dement, J. J., (M.I.) Meridianville, 1857.
Denney, A. Suggsville, 1855. (d.)
English, John A. Cahaba, 1853. (d.)
Fort, Chas. H. Tuskegee, 1879.
Fournier, Edmond Henry, Mobile, 1869.
Franklin, Chas. H. Union Springs, 1879.
Furniss, John P. Selma, 1879, 80.
Gaines, Edmund P. Mobile, 1869, 70, 73.
Gindart, A. Montgomery, 1872.
Gordon, F. E. Marion, 1850. (d.)
Hargraves, J. Theophilus, Florence, 1850, 58, 69. (d.)
Henderson, Wm. Mobile, 1872.
Hereford, Francis Mason, Montgomery, 1869.
Heustes, James Fountain, Mobile, 1869.
Hogan, Samuel M. Union Springs, 1879.
Holt, Wm. J. Montgomery, 1879.
Howell, Thomas J., (M.) Montgomery, 1853.
Jackson, W. C. Montgomery, 1879.
Johnson, B. F. Notasulga, 1879.
Johnson, Jos. Henry, Talladega, 1868, 69.
Johnson, W. B. Marion, 1850. (d.)
Johnston, Egbert Beale, Tuskegee, 1870, 72.
Johnston, John Foot, Montgomery, 1870, 72.
Jones, Benj. Rush, Montgomery, 1849, 72.
Kitchum, Geo. A. Montgomery. 1880.
Kumpe, Geo. E. Leighton, 1875.
Liftwich, W. D., (M.I.) Huntsville, 1857.
Lopez, A. Mobile, 1850 V.P., 52. (d.)
Lynch, John S. Mobile, 1872.
McCloskey, Laurence Aure, Mobile, 1869. (d.)
McDaniel, Edward Davis, Camden, 1869, 70.
Malone, T. Stith, Athens, 1857.
Mason, Edmonds, Wetumpka, 1870. (d.)
Merriwether, Geo. M. Mathews Station, 1853, 57, 70. (d.)
Michel, Richard Fraser, Montgomery, 1868, 69, 70, 72 V.P., 79, 80.
Miller, Robinson, Mobile, 1853, 69. (d.)
Mitchell, Wm. A. Eufaula, 1880.
Morgan, Isaiah Dubois. Mobile, 1869.
Morris, Anthony T., (M.) Mobile, 1849.
Morris, J. Webb, Courtland, 1857.
Moses, Grats A. Mobile, 1873.
Norris, George D., (M.I.) New Market, 1857, 59.
Oliver, Abner McCarty, Montgomery, 1869. (d.)
Osborn, Thomas C. Greensboro, 1869.
Owen, Pascal Harrison, Montgomery, 1869.
Parke, Clifford D. Selma, 1876.
Percival, C. F. Loundes, 1852.
Pollard, Geo. Fitz Edward, Montgomery, 1869. (d.)
Pride, J. P. Prides Station, 1872.
Pritchett, John Albert, Hayneville, 1879.
Reese, Augustus Jorden, Mobile, 1859, 69.
Reese, W. P. Selma, 1857, 59, 69. (d.)

Riggs, Benjamin H.	Selma, 1869.
Ross, Francis Armstrong,	Mobile, 1869.
Scales, T. Sidney,	Mobile, 1872.
Seely, Samuel Dibble,	Montgomery, 1869, 70, 75, 76 v.p.
Sims, J. Marion,	Montgomery, 1852.
Smith, Samuel P.	Prattsville, 1872.
Sowell, J. F., (M.I.)	Athens, 1857.
Thornton, Wm. H.	Eufaula, 1857.
Tipton, F.	Selma, 1880.
Toole, B. W., (M.I.)	Talladega, 1879.
Turney, Isaac N., (M.I.)	Summerville, 1859.
Weatherly, Job Sobieskie,	Montgomery, 1868, 69, 71 v.p., 72, 80.
Winn, Jos. J.	Clayton, 1879.
Winn, P. C.	New Berne, 1857.

ARKANSAS.

Armstrong, F. W., (M.I.)	Pine Bluff, 1857. (d.)
Borland, Solon, (M I.)	Little Rock, 1853. (d. 1864.)
Breysacher, A. L.	Little Rock, 1873.
Burke, F. N.	Helena, 1877.
Byrd, D. Ellis,	Marvel, 1876.
Carrigan, A. N.	Washington, 1877.
Carroll, R. J.	Fayetteville, 1876.
Christian, Robert B.	Fulton, 1879.
Collins, John W.	Hot Springs, 1877.
Cross, Edward, (M.I.)	Little Rock, 1879, 80.
Cummings, J. B.	Forrest City, 1879, 80.
Dale, E. T.	Texerkana, 1880.
Denell, Edmund V.	Little Rock, 1876.
Dibrell, James A., Jr.	Little Rock, 1875, 76, 77, 79, 80.
Dungan, David H.	Little Rock, 1873, 79.
Du Val, E. R.	Fort Smith, 1880.
*Easley, E. T.	Little Rock, 1876, 77, 78. (d. 1878.)
Ewing, D. C.	Batesville, 1880.
Fortner, B. F.	Fayetteville, 1876.
Goodwin, B. C.	Marville, 1879.
Hartt, George C.	Little Rock, 1876.
Hawkins, Wm. Harrison,	Rocky Comfort, 1879.
Hooper, P. O.	Little Rock, 1875, 76, 77, 78, 79.
Horner, A. A.	Helena, 1876, 77, 78, 79.
Jennings, Rosco Green,	Little Rock, 1869, 72, 76, 77, 79, 80.
Jones, J. J., Jr., (M.I.)	Little Rock, 1879.
Keller, James M.	Hot Springs, 1877, 78, 80.
Lacy, John M.	Cincinnati, 1879.
Laurence, W. B.	Balesville, 1879.
Lawrence, George W., (X.)	Hot Springs, 1873, 76.
Lenow, James H.	Little Rock, 1875, 76, 79.
Linthicum, D. A.	Helena, 1873, 75, 76, 78, 79, 80.
McAlpin, W. W.	Helena, 1879.
McDowell, Drake,	Hot Springs, 1877.
McGavock, F. G., (M.I.)	Pecan Point, 1857.
Mathews, W J.	Forrest City, 1879.
Murrell, T. E.	Little Rock, 1877.
Nash, Charles E.	Helena, 1878.
Owens, J. A.	Pine Bluff, 1873.
Pace, Jesse Mercer,	Camden, 1877.
Pangborn, D.	Judson, 1876.
Ross, R. N., (M.I.)	Lonoke, 1879.
Scott, Andrew H.	Dover, 1870, 72.

Skipwith, E. H., (X.)	Little Rock, 1876.
Smith, Thomas,	Little Rock, 1875.
Wallis, R. S.	Arkadelphia, 1880.
Watkins, Claibourne,	Little Rock, 1869, 73.
Welch, W. B.	Boonsboro, 1873, 76, 79.
Woods, Jos. E.	Augusta, 1877.
Wright, Wm. Green, (M.I.)	Eldorado, 1869.

CALIFORNIA.

Ayer, W., (M.I.)	San Francisco, 1871.
Ayres, W. O.	San Francisco, 1871. (d.)
Baker, Martin,	Vista, 1876. (d. 1880.)
Barber, E. T.	Oakland, 1871.
Barstow, Wm. A., (M.I.)	San Francisco, 1871. (d. 1871.)
Bates, C. M.	San Francisco, 1871.
Bentley, Edwin,	San Francisco, 1871.
Bradbury, W. T., (M.I.)	San Francisco, 1871. (d. 1879.)
Briceland, J. M., (M.I.)	Shasta, 1871.
Bryan, E. W., (M.I.)	San Francisco, 1871.
*Caldwell, Augustin B.	San Jose, 1871. (d. 1876, æt. 57.)
Carman, Wm., (M.I.)	San Francisco, 1871.
*Cheney, W. Fitch,	Chico, 1871. (d. 1879, æt. 48.)
Chesley, Chas. P., (M.I.)	San Francisco, 1871.
Chapman, M. M.	San Francisco, 1876.
Cluness, W. Robert,	Sacramento, 1871, 72.
Cohn, David,	San Francisco, 1871.
Cole, R. Beverly,	San Francisco, 1871, 79, 80 v.p.
Cushing, Clinton,	San Francisco, 1871.
Davis, M. R.	San Francisco, 1871.
Dean, B. D.	San Francisco, 1871.
Dean, C. T.	San Francisco, 1871.
Dutton, J. W., (M.I.)	Tomales, 1871.
Ellinwood, C. N.	San Francisco, 1871.
Evans, George H., (M.I.)	Dixon, 1871.
Ferris, Anson S.	San Francisco, 1871.
Fisk, Henry M.	San Francisco, 1871, 72.
*Fourgeand, Victor J.	San Francisco, 1871 (d. 1875, æt. 59.)
Fox, W. R.	San Francisco, 1871.
*Franklin, John J.	Sonora Co., 1871. (d. 1875.)
Gates, Horatio S., (M.I.)	San Francisco, 1871. (d.)
Gates, Vandervort B.	San Francisco, 1871.
Gibbons, Henry,	San Francisco, 1871 v.p.
Gibbons, Henry, Jr.	San Francisco, 1871.
Gibbons, W. P.	Alameda Co., 1871.
Grover, Wm. A.	San Francisco, 1871.
Haine, Joseph, (M.I.)	San Francisco, 1871.
Hardy, Benj. F.	San Francisco, 1871.
*Harris, Stephen R., (M.I.)	San Francisco, 1853, 71. (d. 1879, æt. 79.)
Harvey, Obadiah,	Galt, 1858, 71.
Hatch, F. W.	Sacramento, 1871.
*Hatch, Thruston B., (M.I.)	San Francisco, 1871. (d. 1874, æt. 29.)
Herenberg, T., (X.)	San Francisco, 1871.
Hewston, George,	San Francisco, 1871.
Hoffman, Daniel B.	San Diego, 1871.
Hudson, A. T., (M.I.)	Stockton, 1871.
Humphrey, P. H., (M.I.)	San Francisco, 1871.
Johnson, W. H.	San Francisco, 1871.
Kelley, E.	San Francisco, 1871.
Kollock, John M.	San Francisco, 1871.

Lane, Levi C.	San Francisco, 1871.
Little, Wm. B., (M.I.)	1860.
*Logan, Thomas M.	Sacramento, 1867, 71, 72 V.P., 73 P. (d. 1876.)
Lovelace, Lemuel M.	Le Moore, 1877.
Mehering, A. B.	Vista, 1871. (d. 1878, æt. 37.)
Montgomery, J. F.	Sacramento, 1871.
Murphy, James,	San Francisco, 1871.
Neal, Harrison,	Hollister, 1871.
Neill, E. H., (M.I.)	Yolo Co., 1871.
Nixon, A. B.	Sacramento, 1871.
Oatman, Ira E.	Sacramento, 1871.
Paramore, E. L.	Woodland, 1871.
Pierson, B. H., (M.I.)	Sacramento, 1871.
Pinkerton, T. H., (M.I.)	Oakland, 1871.
Precht, Carl, (M.I.)	San Francisco, 1871.
Regensburger, Jacob,	San Francisco, 1871.
Richings, C. H., (M.I.)	San Francisco, 1871.
Robinson, Luke,	Colusa, 1871.
Robinson, W. W.	Los Angels, 1871.
Scott, John,	San Francisco, 1871.
Shurtleff, G. A.	Stockton, 1871.
Simmons, G. L.	Sacramento, 1871, 74.
Simpson, James,	San Francisco, 1871.
Sims, H. L., (M.I.)	San Francisco, 1880.
Smith, (M.I.)	1852.
Smith, W. F.	San Francisco, 1871.
Soule, Artemus G.	San Francisco, 1871.
Stockton, E. A.	Stockton, 1871.
Stout, Arthur B.	San Francisco, 1871.
Thorndike, Albert,	Stockton, 1871. (d.)
Thorne, Walter Scott,	San Jose, 1871.
Titus, Isaac S.	Stockton, 1871.
Todd, F. Walton,	Stockton, 1871.
Tonner, J. A.	San Francisco, 1876.
Trenor, Eustace,	Alameda, 1871.
Tucke, J. C.	San Francisco, 1866, 70, 71, 72.
Tyrrell, Gerard G.	Sacramento, 1871.
Van Wyck, John C., (M.I.)	Oakland, 1871. (d. 1877, æt. 49.)
Wayland, J. F.	Chico, 1871.
White, George A.	Sacramento, 1871.
Whitney, J. D.	San Francisco, 1871.
Whitney, J. P.	San Francisco, 1871.
Wythe, W. J.	San Francisco, 1872.

COLORADO.

Beshoar, Michael,	Trinidad, 1874.
Bibb, George R.	Denver, 1871. (d. 1874.)
Bissell, Charles R.	Colorado Springs, 1877.
Buckingham, R. G.	Denver, 1871.
Byford, Henry T.	Denver, 1874.
Cole, Samuel,	Denver, 1877.
Denison, Charles,	Denver, 1875, 77, 78, 80.
Dodge, Horace O.	Boulder, 1877.
Elsner, John,	Denver, 1871, 72.
Gehrung, Eugene C.	Denver, 1873.
Lemen, Lewis E.	Georgetown, 1877.
McClelland, W. F.	Denver, 1872.
Pollock, Irving J.	Georgetown, 1873.

Solly, Samuel Edwin, Monetabo, 1877.
Williams, W. H. Denver, 1872.

CONNECTICUT.

Abernethy, Augustus H., (X.) Bridgeport, 1870.
Alton, C. D., (M.I.) Hartford, 1880.
Avery, Geo. W. Hartford, 1878.
Bacon, Francis, New Haven, 1876.
Baker, Rufus, Middletown, 1853, 60, 64, 80.
Baker, B. Fordyce, Norwich, 1848, 49.
Barnes, Julius S. Southington, 1860. (d.)
Barrows, Ashbell W. Hartford, 1853, 60, 63, 76. 80.
*Beach, Samuel, Bridgeport, 1849, 53. (d. 1853.)
Beardsley, Lucius N. Milford, 1853, 55, 60, 63, 64, 68.
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Bennett, Ezra P. Danbury, 1860.
Bennett, Hanford N. Bridgeport, 1853, 60, 64.
Bresford, Samuel B. Hartford, 1848, 53. (d.)
Bidwell, Edwin, Deep River, 1868.
Bishop, E. H. New Haven, 1847, 53, 55, 60.
Bishop, Timothy H. New Haven, 1865, 80.
Bissell, G. G., (M.) Bethlem, 1853.
Blackman, George, Westport, 1858, 60. (d.)
Blake, Eli Whitney, New Haven, 1864, 65. (d. 1872.)
Blake, J. E., (O.) Middletown, 1865.
Blakeman, Rufus, Fairfield, 1846, 60. (d.)
Bostwick, David E. Litchfield, 1853, 58, 60. (d.)
Bowen, Samuel, Thompson, 1849. (d.)
Bradford, Milton, Woodstock, 1849.
Brainard, D. T. New London, 1846. (d.)
Brigham, Norman, Mansfield, 1848. (d.)
Brinley, Edward H. Hartford, 1858, 60.
Bronson, Henry, New Haven, 1850, 52, 53.
Brown, James, Waterbury, 1858, 60.
Brownell, Clarence M. East Hartford, 1853. (d.)
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Budington, Geo E. New Haven, 1855.
Buell, Henry W. Litchfield, 1860, 76.
Burke, Geo. W. Middletown, 1855.
Burke, W. C., Jr., South Norwalk, 1880.
Burr, David S. Westport, 1855, 58, 60. (d. 1865.)
Burr, Horace, Middlesex Co., 1863.
Butler, John S. Hartford, 1869.
Byington, N. H. Southampton, 1870. (d.)
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Carleton, Charles M. Norwich, 1865, 66, 70, 80.
Carmalt, Wm. H. New York, 1880.
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Carrington, Henry A. New Haven, 1868.
Casey, William B. Middletown, 1849, 53. (d.)
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Catlin, Benjamin H.	West Meriden, 1853, 55, 56, 58, 60, 63, 64, 65, 66, 67, 68, 70, 71, 72, 73 V.P., 74, 75, 76, 78. (d. 1880.)
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Childs, Seth L.	East Hartford, 1860, 65.
Churchill, Asa Hopkins,	West Meriden, 1880.
Clark, Wm. N.	Stafford, 1860.
Clary, George,	Hartford, 1860.
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Cogswell, William H.	Plainfield, 1846, 60. (d.)
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Comstock, Joseph,	Lebanon, 1858, 60. (d.)
Crary, David,	Hartford, 1858, 60.
Daggett, David L.	New Haven, 1860.
Davis, G. Pierrepont,	Hartford, 1880.
DeForest, Wm. B.	New Haven, 1864, 78.
Deming, Ralph,	Sharon, 1856, 58, 60, 63, 64, 65. (d.)
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Dickinson, Francis L.	Rockville, 1853, 55.
Dow, V. M.	New Haven, 1846. (d.)
Downes, John K.	New Haven, 1855. (d.)
Downing, Eleazer B.	Preston, 1849. (d.)
Edgertown, F. D.	Middletown, 1876.
Farnham, Geo. Bronson,	New Haven, 1872.
Ford, John D.	Norwich, 1855, 56. (d.)
Fowler, Bernus M.	Washington, 1848, 60.
Fox, Charles Jas.	Willimantic, 1880.
Francis, D. P.	New London, 1856.
Gilbert, G. C. H.	Portland, 1860. (d.)
Gillett, H. C.	South Windsor, 1858. (d.)
Goodrich, Alfred R.	Vernon, 1860.
Goodwin, Ralph S., (X.)	Thomastown, 1876, 80.
Gourdin, Samuel C.	New Haven, 1860.
Granness, J. H.	Seabrook, 1880.
Gray, Robert M.	Stratford, 1870, 73. (d.)
Griggs, O. B.	Mansfield, 1860, 78.
Haile, Ashbel B.	Norwich, 1849, 65. (d.)
Hall, Eli,	East Hartford, 1849. (d.)
Hall, Newton B.	Branford, 1865. (d.)
Hammond, Cornelius E.	Portland, 1872.
Hammond, Justin,	Daysville, 1848. (d.)
Harrison, B. F.	Willingsford, 1870, 72, 80.
Harrison, David,	Middletown, 1855, 56. (d.)
Hart, Fredrick, A., (E.P.M.)	Southington, 1865.
Hastings, Panet M.	Hartford, 1860.
Hatch, Johnson C.	Kent, 1847, 53. (d.)
Hawley, George B.	Hartford, 1860, 64.
Hawley, Roswell,	Bristol, 1853. (d.)
Hazen, Miner C.	Haddon, 1864, 65, 70, 76.
Hill, Edwin A.	East Killingly, 1864, 65, 70, 80.
Hills, T. Morton,	Willimantic, 1870, 72, 76, 80.
Holbrook, Lowell,	Thompson, 1876, 80.
*Hooker, Charles,	New Haven, 1850, 51, 52, 53, 54, 55, 56, 57, 58, 60. (d. 1863.)
Hooker, Worthington,	New Haven, 1849, 50, 51, 52, 53, 60, 64 V.P., 65 V.P., 66. (d. 1868.)
Hubbard, Charles H.	Essex, 1870.
Hubbard, Denison H.	Clinton, 1858, 65. (d.)
Hubbard, Robert,	Bridegeport, 1853, 55, 60, 70.

Hubbard, Stephen G.	New Haven, 1849, 63, 64, 70, 80.
Hunt, Ebenezer K.	Hartford, 1860, 70, 71, 77.
Hunt, Eleazer,	Coventry, 1846. (d.)
Hutchins, Samuel,	East Brooklyn, 1853.
Hutchinson, Ira,	Crownwell, 1855.
Huxley, A. M.	Goshen, 1853. (d.)
Ives, Charles L.	New Haven, 1865, 71, 72 V.P. (d.)
*Ives, Eli,	New Haven, 1847, 49 (M.).'60 P. (d. 1861.)
Ives, J.	1846.
Ives, Levi,	New Haven, 1860, 64, 68.
Ives, Nathaniel B.	New Haven, 1847, 48, 49, 50, 51, 52, 53, 54, 55, 56, 58, 60. (d.)
Ives, R. S.	New Haven, 1870, 72.
Jackson, James C.	Hartford, 1865, 70.
Jarvis, George C.	Hartford, 1849, 72.
Jarvis, George O.	Portland, 1869. (d.)
Jewett, Pliny A.	New Haven, 1848, 53, 55, 60.
Kent, J. B.	Putnam, 1874, 80.
Kinney, E. C.	Norwich, 1880.
Knight, Henry M.	Lakeville, 1864, 71, 72, 76, 77, 78. (d.)
Knight, J., (M.I.)	New Haven, 1864.
*Knight, Jonathan,	New Haven, 1846 P., 47 P., V.P., 48, 49, 50, 52 V.P., 53 P., 55, 60, 64. (d. 1864)
Knight, W. W.	Sharon, 1880.
Lee. Charles L.	New Haven, 1864.
Levenworth, Milnar C.	Waterbury, 1880. (d.)
Lewis, John B.	Vernon, 1858.
Lindsley, Charles A.	New Haven, 1855, 56, 60.
Lyman, Norman,	Warren, 1849. (d.)
Lyon, E. B.	New Britain, 1880.
Lyon, Irving W., (O.)	Hartford, 1865.
McGregor, John,	Thompson, 1864, 65. (d. 1868).
Manwaring, R. A.	New London, 1860.
Matthews, Henry W. E.	New Haven, 1855, 60, 64. (d.)
Matthewson, Rufus W.	Durham, 1860.
Middlebrook, Elijah,	Trumbull, 1847, 49, 53. (d.)
Miller, Gaylord B.	Harwinton, 1860.
Moody, Anson,	New Haven, 1853.
Moody, George A.	Plainville, 1858, 60. (d.)
Munger, W. S.	Watertown, 1876, 80.
Nelson, J. D., (M.I.)	Stonington, 1880.
Nicoll, John,	New Haven, 1855.
North, Alfred,	Waterbury, 1866, 70, 71, 72, 80.
North, B. B.	Cornwall, 1856, 60. (d.)
Noyes, Samuel S.	New Canaan, 1855, 60, 64, 65.
Noyes, S. S., (M.I.)	Norwalk, 1864.
Nye, Elisha B.	Middletown, 1855, 65, 74, 80.
Paddock, Lewis S.	Norwich, 1860.
Page, Charles W.	Hartford, 1879, 80.
Palmer, George E.	Stonington, 1864. (d.)
Pardee, Moses B.	South Norwich, 1872.
Park, Edwin A.	New Haven, 1860.
Parker, Julian N.	Hartford, 1880.
Peters, Manley,	Woodville, 1848.
Phelps, J. W.	Wolcotville, 1864, 71.
Pierson, William S.	Windsor, 1849, 60. (d.)
Pike, Nathan S.	Sterling Hill, 1853. (d.)
Pinney, Charles H.	New Haven, 1875, 76, 78, 80.
Platt, Gideon L.	Waterbury, 1848, 55, 60.

Porter, Geo. L.	Bridgeport, 1872, 80.
Porter, Isaac G.	New London, 1860, 72.
Preston, G. H.	Tolland, 1865, 80.
Preston, S. C.	Hartford, 1864.
Punderson, S.	New Haven, 1848.
Richardson, Wm H.	Mansfield, 1860, 65. (d.)
Robinson, Rienzi,	West Killingly, 1876, 80.
Rockwell, P. Guitean,	Waterbury, 1854, 56, 58, 60, 66.
Rockwell, S. W.	South Windsor, 1870, 80.
Rogers, Benjamin,	Hartford, 1849. (d.)
Russell, Gurdon W.	Hartford, 1853, 77, 78 V.P.
Salisbury, Samuel T.	Plymouth, 1855, 58. 60. (d.)
Sanford, Leonard J.	New Haven, 1855, 58, 65, 72.
Scott, Wm.	North Manchester, 1876. (d.)
Seymour, George,	Litchfield, 1858, 60. (d.)
Shelton, G. A.	Huntingdon, 1880.
Shepard, Frederick W., (M.)	Lower Saybrook, 1853. (d.)
Shove, Harmon W.	Woodbury, 1860.
*Silliman, Benj., Jr., (O.)	New Haven, 1860.
Skinner, Alden,	Rockville, 1849, 55, 60. (d.)
Steadman, W. G.	Southington, 1880.
Stearnes, Henry P.	Hartford, 1870.
Stillman, Roswell F.	North Haven, 1860, 64, 68.
St. John, G. H.	Merwinsville, 1849, 58.
Stone, Robert,	New Haven, 1866.
Storrs, M.	Hartford, 1880.
Strickland, R.	Hartford, 1872, 73, 80.
Sumner, Charles F.	Bolton, 1865.
Sumner, George,	Hartford, 1846, 47, 49, 52. (d.)
Sumner, George O.	New Haven, 1860. (d.)
Swasey, E. P.	New Britain, 1880.
Talcott, Alvan,	Sulford, 1852, 53, 58, 60, 64, 74.
Taylor, Nathaniel W., Jr.,	New Haven, 1849. (d.)
Tiffany, Russel H.	Canton, 1865.
Totten, J. A.	New Haven, 1855, 58. (d.)
Townsend, T. Beers,	New Haven, 1864.
Turner, Sylvester W.	Chester, 1860, 72, 80.
Tyler, David A.	New Haven, 1864.
Wainwright, Wm. A. M.	Hartford, 1873, 77, 80.
Warner, Abner S.	Hartford, 1860.
Warner, Richard,	Cornwall, 1846, 48. (d.)
Webb, Reynold,	Madison, 1849, 55. (d.)
*Welch, Archibald,	Hartford, 1848, 53. (d.)
Welch, Benjamin,	Lakeville, 1850, 53, 60. (d.)
Welch, J. W., (M.I.)	West Winton, 1880.
Welch, James,	Winstead, 1855, 60, 64, 65.
Welch, William W., (M.I.)	Norfolk, 1855, 60, 80.
Welsh, John H.	Norfolk, 1860.
White, Moses C.	New Haven, 1860.
White, R. A.	Simsbury, 1853.
Wilcox, Justus D.	West Granby, 1858, 60. (d.)
Wilcox, Lucian S.	Hartford, 1860, 65, 76, 77, 78, 80.
Wile, Wm. C.	Sandy Hook, 1880.
Williams, A. L.	Brookfield, 1860.
Williams, Datus, (M.)	East Haddam, 1853. (d.)
Williams, Lewis,	Pomfort, 1855, 60, 65, 75, 76.
Wilson, Myron W.	Hartford, 1855. (d.)
Witter, William,	Windham, 1849. (d.)
Wood, Orson, (M.)	Somers, 1853. (d.)
Wood, William, (M.)	East Windsor, 1853, 60.
Woodruff, Franklin, (M.)	New Britain, 1853. (d.)

Woodruff, William,	Thomaston, 1856, 58, 60, 65, 66, 71, 78, 80.
Woodward, Ashbell,	Franklin, 1849, 51, 53, 55, 58, 60, 64, 65, 66, 68, 70, 72, 76, 78, 80.
Woodward, Charles,	Middletown, 1860. (d.)
Worthington, Albert B.	Middle Haddam, 1864, 78.
Wright, A. A.	Canaan, 1848.
Wright, Theodore G.	Plainville, 1880.

DELAWARE.

*Askew, Henry Ford,	Wilmington, 1847, 48, 49, 52, 53, 55, 58, 59 v.p., 60, 63, 64, 66, 67 p., 68, 69, 70, 72, 73, 74. (d.)
Baker, G. W.	Wilmington, 1847. (d. 1862.)
Black, John J.	New Castle, 1876.
Bulloch, Wm. R.	New Castle, 1855.
Bush, Lewis P.	Wilmington, 1846, 47, 48, 55, 60, 70, 72.
Clark, Robert H.	Milford, 1855.
Clawson, James Emory,	Smyrna, 1864, 66.
Collins, William T.	Smyrna, 1866.
*Couper, James,	New Castle, 1846, 47, 48, 50, 52, 55, 63 v.p., 64, 65. (d.)
Cummins, William,	Smyrna, 1846, 47, 58, 60.
*Dailey, E. D.	Smyrna, 1858. (d.)
Ellgood, Robert G.	Concord, 1872, 80.
Grimshaw, Arthur F.	Wilmington, 1849.
Grimshaw, A. H.	Wilmington, 1851.
Hall, David,	Lewes, 1872.
Hamilton, W. N.	Cantwell's Bridge, 1847, 72.
Hirons, R. S. W.	Smyrna, 1864, 66, 72.
Johnson, R. P.	Wilmington, 1858, 60.
Jones, Charles W.	Wilmington, 1866. (d.)
Jones, Waitman,	Vernon, 1855.
Jump, Isaac,	Dover, 1848, 55, 70, 72.
McKay, R. J.	Wilmington, 1880.
Marshall, Wm.	Milford, 1872, 76, 77, 79, 80.
Maxwell, G. T.	Wilmington, 1880.
*Merritt, John,	Middleton, 1855. (d. 1872.)
*Mitchell, James R.	Milford, 1855. (d.)
*Morris, Wm. Windsor,	Dover, 1846, 47. (d. 1857.)
*Perkins, John D.	Smyrna, 1848. (d. 1860.)
*Porter, Robert R.	Wilmington, 1847, 55, 72, 73, 74. (d. 1876.)
Richards, Charles H.	Georgetown, 1872, 79.
Richards, E. S.	1846.
Rogers, T. C.	Willow Grove, 1864, 66, 72. (d.)
Saulsbury, Gove,	Dover, 1846, 55.
Smith, Thomas M.	Brandywine, 1849.
Stuart, Wm. W.	1846. (d.)
Thomson, James W.	Wilmington, 1846, 47, 51, 52 v.p., 55, 56.
Vallandingham, Irving S.	St. Georges, 1872.
Wales, John P.	Brandywine, 1855.
Wilson, Jas. F.	Wilmington, 1849, 55, 68.

DISTRICT OF COLUMBIA.

Allen, Charles, (X.)	Washington, 1866, 68.
Antisell, Thomas,	Washington, 1858, 66, 68, 70, 80.
Ashford, F. A.	Washington, 1868, 70. 72.
*Aulich, R. V.	Washington, 1872. (d. 1872.)
Barker, H. H.	Washington, 1872.
Baxter, J. H.	Washington, 1865, 66. 72, 78.
*Berry, Wm. H.	Washington, 1858. (d. 1859.)
Bliss, D. W.	Washington, 1868, 70.
Bourman, Charles V.	Washington, 1840.
Bogan, M. V. B.	Washington, 1868, 70.
Bogan, S. W.	Washington, 1880.
*Bohrer, Benjamin S.	Georgetown, 1858. (d. 1862.)
Bond, Samuel S.	Washington, 1866, 68.
Borrows, Joseph,	Washington, 1868.
*Boyle, Cornelius,	Washington, 1848, 51, 52, 55, 58, 59, 60, 70, 72. (d. 1878.)
Bulkley, John W.	Washington, 1868, 66, 70, 78.
Burnett, Swan M.	Washington, 1880.
Busey, Samuel C.	Washington, 1853, 58, 70, 72, 74, 75, 76 v.p., 78, 80.
Bushnell, J. H.	Washington, 1868.
*Butt, Wm. Beale,	Washington, 1870. (d. 1877.)
Chamberlin, Wm. James,	Washington, 1869. (d.)
Combs, W. H.	Washington, 1870.
*Croggan, Richard C.	Washington, 1864, 65, 68, 70. (d 1872.)
*Dove, George M.	Washington, 1853, 55, 58, 66, 67, 68, 70. (d. 1874.)
*Draper, L. J.	Washington, 1868. (d. 1879.)
*Drinkard, Wm. B.	Washington, 1868, 70, 72. (d. 1877.)
DuHamel, W. J. C.	Washington, 1853, 55, 58, 64, 66, 68, 69.
Eliot, Johnson,	Washington, 1858, 65, 67, 68, 70, 72, 74, 75, 76, 80.
Emory, Thomas,	Washington, 1868.
Evans, Warwick.	Washington, 1870.
*Everett, Samuel W.	Washington, 1853. (d. 1862.)
Fenwick, George P.	Washington, 1866, 68, 70, 80.
*Fitch, Geo. A.	Washington, 1870. (d. 1875.)
Ford, Charles M.	Washington, 1865, 66, 68, 70, 72, 80.
Franzoni, C. W.	Washington, 1872.
Frye, T. B. J.	Washington, 1848.
Garnett, Alex. Y. P.	Washington, 1852, 53, 56, 68, 70, 76.
Glennan, P.	Washington, 1868.
Hagner, Charles E.	Washington, 1870.
Hagner, Daniel R.	Washington, 1864, 66, 68, 70.
Hall, James C.	Washington, 1855, 58, 70. (d. 1880.)
Hansman, Theodore,	Washington, 1868.
*Hellen, B. Johnson,	Washington, 1855, 58. (d. 1864.)
Herbert, J. W.	Washington, 1880.
*Holston, J. G. F.	Washington, 1870, 72.
Howard, Flodoardo,	Washington, 1847, 48, 64, 67, 68, 72, 73, 74, 76.
Hudson, Wm. L.	Washington, 1880.
Johnson, Joseph Taber,	Washington, 1868, 76, 80.
*Johnston, Wm. P.	Washington, 1848, 58, 66 v.p., 68, 70 (d. 1876.)
Johnston, W. W.	Washington, 1870.
*Jones, William,	Washington, 1858. (d. 1867.)

King, Albert F. A.	Washington, 1866, 67, 68, 70.
Klienschmidt, C. H. A.	Georgetown, 1872, 80.
Lee, William,	Washington, 1866, 68, 70, 74, 76, 78, 80.
Liebermann, Charles H.	Washington, 1858, 70.
Lincoln, N. S.	Washington, 1866, 68, 70, 76.
Lindsly, Harvey,	Washington, 1847, 48, 53, 55, 58 P., 59, 66, 68.
Loomis, Silas L.	Washington, 1864, 65, 66, 67, 68.
Loring, F. B.	Washington, 1880.
Lovejoy, J. W. H.	Washington, 1864, 66, 68, 70.
McKim, S. A. H.	Washington, 1866, 70.
McNally, Valentine,	Washington, 1870.
Magruder, G. L.	Washington, 1880.
*Magruder, Hez.	Georgetown, 1858. (d. 1874.)
Makall, Lewis, Jr.,	Georgetown, 1865, 67, 68, 76.
*Marbury, William,	Georgetown, 1865, 67, 70. (d. 1879.)
Marmion, Wm. V.	Washington, 1880.
*Maury, Thomas F.	Washington, 1866, 68, 70. (d. 1871.)
May, John Fredrich,	Washington, 1847, 53, 58, 70.
Miller, A. W.	Washington, 1870, 72.
*Miller, Geo. R.	Washington, 1870. (d. 1872.)
*Miller, Thomas,	Washington, 1847, 53, 55, 58, 68, 70. (d. 1873.)
Morgan, James E.	Washington, 1848, 52, 53, 55, 58, 64, 66, 68, 73, 74. 76, 80.
Muncaster, Otho,	Washington, 1870.
Nalley, Charles F.	Washington, 1869. (d.)
Newman, W. G. H.	Washington, 1868, 70, 72.
Nichols, Charles H.	Washington, 1858, 68, 77.
Palmer, Gideon S.	Washington, 1872.
Palmer. Wm. G.	Washington, 1866, 70.
Parker, Peter, (M I.)	Washington, 1858.
Peter, Armstead,	Georgetown, 1868, 70.
Philips, James,	Washington, 1866.
Porter, H. T.	Georgetown, 1872. (d.)
Prentiss, D. Webster,	Washington, 1868, 70, 80.
Radcliff, Samuel J.	Washington, 1868.
Reyburn, Robert,	Washington, 1868, 69, 70, 72, 74, 76.
Richards, John,	Washington, 1858. (d. 1862.)
Richey, S. O.	Washington, 1880.
*Riley, John C.	Washington, 1855, 64, 66, 68, 70, 76. (d. 1879.)
*Riley, Joshua,	Georgetown, 1847, 58. (d.)
Ritchie, Louis W.	Georgetown, 1866, 69, 70.
Robbins, H. A.	Washington, 1870.
Roberts, W. E.	Washington, 1870.
Ross, William H.	Washington, 1875, 77.
Sawbell, H. W.	Washington, 1872.
Semmes, Alex. J.	Washington, 1853, 55, 58, 59.
Smith, John E., (X.)	Washington, 1867.
*Smoot, Samuel C.	Washington, 1858. (d. 1866.)
*Snyder, J. M., (M.I.)	Georgetown, 1858. (d. 1863.)
St. Clair, F. O.	Washington, 1870.
Sterner, Lewis H.	Washington, 1855.
Stewart, W. D.	Washington, 1870.
*Stone, Robt. King,	Washington, 1852, 68, 70. (d. 1872.)
*Thomas, James M.	Washington, 1848. (d. 1853.)
Thompson, J. Ford,	Washington, 1866, 67, 68, 70.
Thompson, J. Harry,	Washington, 1868, 70.
*Todd, Seth J.	Washington, 1865, 66, 68, 73. (d. 1874.)

Toner, Jos. M. — Washington, 1864, 65, 66, 67, 68, 69, 70, 71, 72, 73 P., 74, 75, 76, 77, 78, 79, 80.
Townshend, Smith, — Washington, 1872.
Triplett, Wm. H. — Washington, 1875, 78, 80.
Trist, H. B. — Washington, 1866.
Tyler, Grafton, — Georgetown, 1858, 52, 55 V.P., 58, 66, 68, 70, 72.
Walsh, John Karney, — Washington, 1869.
*Walsh, Joseph, — Washington, 1870, 72. (d. 1880.)
Walsh, Ralph S. L. — Washington, 1870, 76, 80.
Waring, Jas. J. — Washington, 1858.
*Williams, Bodisco, — Washington, 1868. (d. 1873.)
Winne, Jas. — Washington, 1848.
*Woodworth, John M. — Washington, 1873, 78. (d. 1879.)
Young, Jas. T. — Washington, 1866, 68.
Young, Noble, — Washington, 1848, 52, 58, 64, 68 V.P., 70, 76.

FLORIDA.

Betton, George W., (M.I.) — Tallahassee, 1853, 76, 79, 80.
Burroughs, R. B. — Tallahassee, 1880.
Hargis, (M.I.) — Pensacola, 1870.
Leonard, Thomas King, (M.I.) — Pensacola, 1853.
Maxwell, S. Troup, (M.I.) — Pensacola, 1872.
Sabal, E. T. — Jacksonville, 1875.
Wakefield, A. J. — Jacksonville, 1880.
Wall, John P. — Tampa, 1879.

GEORGIA.

Alexander, L. B., (M.I.) — Forsyth, 1879.
Alley, A. R. — Atlanta, 1879.
*Arnold, Richard D. — Savannah, 1846, 47, 49, 51 V.P., 55, 57, 58, 60, 68, 69, 72. (d. 1876.)
Armstrong, W. S. — Atlanta, 1879.
Baily, J. W. — Gainsville, 1878, 79, 80.
Banks, John T. — Griffin, 1858, 59, 79.
Battey, Robert, — Boone, 1875, 76, 77, 79, 80.
Beasley, J. A., (M.I.) — West Point, 1879.
Benson, J. W. — Savannah, 1857. (d.)
Black, R. C. — Augusta, 1851. (d.)
Boring, Jesse, — La Grange, 1857.
Boyd, A. M. — Cave Spring, 1858.
Broadhurst, W. W. — Augusta, 1858.
Brown, H. W. — Atlanta, 1860.
Brown, Pike, — Savannah, 1857.
*Bruce, R. J. — Thomasville, 1879. (d. 1880.)
Bullock, Wm. Gaston, — Savannah, 1851, 53.
Calhoun, A. W. — Atlanta, 1879.
Campbell, A. Sibley, — Augusta, 1879.
Campbell, Henry F. — Augusta, 1851, 53, 57 V.P., 58, 59, 79, 80
Campbell, Robert, — Augusta, 1849, 51.
Charters, Wm. M. — Savannah, 1866.
Coleman, J. S., (M.I.) — Augusta, 1880.
Cook, J. E. — Columbus, 1879.
Colley, Francis S. — Atlanta, 1858.
Cooper, George F. — Americus, 1879.

Connolly, E. P.	Atlanta, 1879.
Crawford, George G.	Atlanta, 1868, 79.
Darnell, T. M.	Griffin, 1858.
Davis, George,	Columbus, 1851.
Dougas, A. E.	Augusta, 1879.
Dougas, Louis A.	Augusta, 1847, 49, 79.
Doughty, W. H.	Augusta, 1859.
Dugas, G. C., (E.P.M.)	Augusta, 1879.
Evans, W. W., (E.P.M.)	Oxford, 1879.
Eve, Joseph A.	Augusta, 1848, 79.
*Eve, Paul F.	Augusta, 1848 V.P., 50, 51. (d. 1877.)
Eve, Robert C., (E.P.M.)	Augusta, 1879.
Fish, James S., (M.)	Macon, 1851.
Ford, Lewis D.	Augusta, 1849, 51.
Franklin, M. A., (M.)	Macon, 1851. (d.)
Garvin, J. P.	Augusta, 1847, 51.
Gilbert, J. G.	Perry, 1851.
Goldsmith, H. T.	Atlanta, 1879.
Goodrich, E. C.	Augusta, 1880.
Gray, S. H.	Forsyth, 1879.
Green, James M.	Macon, 1851.
Griggs, A. W., (E.P.M.)	West Point, 1879.
Grimes, George J.	Columbus, 1879.
Harrell, W. J., (E.P.M.)	Bainbridge, 1879.
Harris, Juriah,	Augusta, 1852. (d. 1876.)
Harris, S. N.	Savannah, 1851. (d. 1854.)
Hickman, Chas. W.	Augusta, 1880.
Hofey, Thomas, (O.)	Columbus, 1853. (d. 1853.)
Hollifield, Horatio N., (M.I.)	Saundersville, 1879.
Hollingsworth, W. T.	Madison, 1858.
Holt, Wm. F.	Macon, 1878, 79.
Hopkins, Thomas S.	Hopkinsville, 1875, 79.
Hoyt, William D.	Boone, 1879.
Howard, J. Gorden,	Madison, 1851, 57. (d. 1854.)
Hoxey, Thomas, (M.)	Columbus, 1853. (d.)
Humphries, J. R.	Acworth, 1879.
Hunt, D. G., (M.I.)	Dalton, 1879.
Jenkins, R. H., (M.I.)	Hogansville, 1879, 80.
Johnson, J. M., (E.P.M.)	Atlanta, 1879.
Jones, John W.	Atlanta, 1859. (d. 1871.)
Jones, Joseph,	Augusta, 1859.
Jones, Thomas J., (M.I.)	Hogansville, 1879.
Jones, W. B.	Atlanta, 1851.
Jones, W. S.	Augusta, 1858.
*Kirkscey, E. J.	Columbus, 1875, 76. (d. 1877.)
Kollock, Phineas M.	Savannah, 1853. (d. 1872.)
Le Hardy, J. C.	Savannah, 1857.
Lewis, R. H.	Savannah, 1875.
Love, William Alra,	Atlanta, 1875, 79.
Logan, Joseph P.	Atlanta, 1857, 58, 60 V.P., 73, 76, 79.
McDowell, George M.	Barnesville, 1879.
McIntosh, T. M.	Thomasville, 1880.
Martin, John D.	Savannah, 1880.
Means, A. H.	Augusta, 1857.
Miller, H. V. N.	Atlanta, 1868, 79.
Moore, K. P.	Atlanta, 1879.
Moore, Richard D.	Athens, 1851.
Nottingham, C. B.	Macon, 1852, 70. (d. 1876.)
Nunn, R. J., (M)	Savannah, 1876.
O'Daniel, W.	Bullards, 1879.
O'Gilby, H. I.	Madison, 1849. (d. 1873.)

Oliver, M. H.	Atlanta, 1857.
Padelford, Geo. P.	Savannah, 1857. (d. 1861.)
Payne, A. S.	Markham, Va., 79, 1880. (?)
Perdue, H.	Barnesville, 1879.
Phinizy, T. B.	Augusta, 1851.
Posey, J. F.	Savannah, 1851.
Powell, Theophilus O.	Milledgeville, 1879.
Powell, Thomas ~~B.~~ S.	Sparta, 1857, 58, 70, 72, 76, 79.
Powers, N. F.	Harrison, 1857.
Raines, Thos.	Atlanta, 1880.
Read, J. B.	Savannah, 1851.
Richardson, C. P.	Savannah, 1851.
Ridley, Robert B., (E.P.M.)	Atlanta, 1872, 1879.
Roach, E. J.	Atlanta, 1879.
Roberts, J. B., (E.P.M.)	Saundersville, 1879.
Robertson, J. G.	Savannah, 1852.
Rosser, J. P., (M.I.)	Conyers, 1879.
Ruffin, W. R.	Augusta, 1852.
Scott, Henry F.	Atlanta, 1879.
Semmes, Alex. Jenkins,	Macon, 1869.
Simmons, James N.	Atlanta, 1850, 51, 58. (d. 1871.)
Smith, B. M.	Atlanta, 1858.
Smith, Hiram,	Augusta, 1879.
*Smith, Robert Mark,	Athens, 1869, 70, 76. (d. 1878.)
Stephens, W. B., (M.)	1849.
Taliaferro, V. H.	Atlanta, 1879.
Taylor, A. P.	Thomasville, 1879.
Thomas, A. G.	Atlanta, 1859.
Thomas, J. G.	Savannah, 1879, 80.
Todd, J. Scott,	Atlanta, 1872, 79.
Tufts, Johnson B.	Savannah, 1847.
Walsh, Wm. M.	Savannah, 1870.
Walton, C. R.	Augusta, 1857.
Westmoreland, J. G.	Atlanta, 1859, 79.
Westmoreland, W. F.	Atlanta, 1872, 74, 76, 78, 79, 80.
Whitehead, A. G.	Waynesboro', 1880.
Wright, P. H.	Macon, 1879.
Wright, Thomas R., (E.P.M.)	Augusta, 1879.

ILLINOIS.

Albin, George W.	Neoga, 1873, 77.
Allen, George T.	Marine, 1854.
Allen, J. Adams,	Chicago, 1877.
Allmond, R. J., (E.P.M.)	1873.
Amerman, Geo. K.	Chicago, 1863, 64. (d.)
Anory, Samuel A.	Quincy, 1870.
Andrews, Edmund,	Chicago, 1856, 63, 64, 73, 75, 77.
Andrews, L. M.	Princeville, 1873.
Babcock, A. C.	Galena, 1877, 78.
Bailey, F. K.	Joliet, 1856.
Baker, L. H.	Payson, 1873.
Baldwin, S Y.	Decatur, 1854, 56.
Bane, M. M., (M.I.)	1854.
Banks, E. C.	Charleston, 1856.
Barnes, Ira N.	Decatur, 1877.
Barnett, C. V., (M.I.)	1863.
Bartlett, John, (E.P.M.)	Chicago, 1863, 65, 77.
Bassett, M. F.	Quincy, 1864.
Beach, Rollen E.	Pataka, 1874.

Berkebile, J. K.	Millstadt, 1879.
*Bevan, Thomas (E.P.M.)	Chicago, 1863. (E.P.M., 77.)
*Bibb, George Richard,	Jacksonville, 1869. (d. 1874.)
Birney, Samuel H.	Nebano, 1873.
Blackman, F. H.	Geneva, 1877.
Blake, Samuel C.	Chicago, 1877.
Blaney, J. V. Z.	Chicago, 1855. (d. 1874.)
Blelock, N. G.	Mt. Zion, 1872.
Bloodgood, James,	Chicago, 1854, 56.
Bogue, Roswell G.	Chicago, 1867, 77.
Booe, T. Newton,	Loda, 1873.
Booth, David S.	Sparta, 1876.
Braffet, Jas. H.	Paw Paw, 1880.
*Brainard, Daniel,	Chicago, 1850 V.P., 52, 53, 54, 55, 56, 59. (d. 1866.)
Breed, S. P.	Princeton, 1870, 73, 77.
Bremer, L.	Belleville, 1878.
Brengle, Daniel D., (E.P.M.)	Winchester, 1863.
Bridge, Norman,	Chicago, 1870, 77.
Bridges, V. R.	Salsbury, 1856.
Brooks, Jonathan W., (E.P.M.)	Chicago, 1863.
Brother, Fred.,	Bunker Hill, 1876.
Brower, Daniel R.	Chicago, 1877.
Brown, H. B.	Rockford, 1863.
Brown, J. A.	Kankakee, 1863.
Buck, H. B.	Springfield, 1876.
Bunce, James,	Galesburg, 1854.
Byford, Henry T.	Chicago, 1877.
Byford, Wm. H.	Chicago, 1863, 64, 67, 74, 75, 76, 77.
Byrd, Wm. A.	Quincy, 1873, 77, 79, 80.
Cannon, E. B.	Suscola, 1873.
Casal, F. M.	Pittsfield, 1880.
Catherwood, Thomas L.	Mocaqua, 1873.
Catlin, E. P.	Monteno, 1877.
Center, Geo. F. (E.P.M.)	Olney, 1873.
Chaffee, Cas. W. (E.P.M.)	Chicago, 1877.
Chamberlain, G. M., (E P.M.)	Chicago, 1877.
Chamberlain, W. O.	Princeton, 1863.
Chambers, Wm. Mortimer,	Charleston, 1867, 69, 73, 75, 77.
Chambers, Wm. M., Jr.	Charleston, 1877.
Chapman, Geo. H.	Gid. Crossing, Mich., 1880.
Cheeney, L. P., (E.P.M.)	Chicago, 1863. (d. 1863.)
Chenoweth, W. J.	Decatur, 1872, 77, 78, 80.
Chew, J. H., (E.P.M.)	Napierville, 1877.
Clark, C. M., (E.P.M.)	Galva, 1863.
Clark, Charles W.	Rockford, 1854.
Clark, Lucius,	Rockford, 1863, 78.
Clarke, Wm. E.	Chicago, 1877.
Cleveland, E. F.	Dundee, 1880.
Cochran, W. G.	Farmer City, 1873, 76.
Cocoran, George L., (M.)	Brimfield, 1873, 77.
Coffin, S. D., (M.I.)	Bloomfield, 1868.
Cohen, L. H.	Quincy, 1873.
Colburn, E. M.	Peoria, 1854.
Cole, Frederick,	El Passo, 1876, 77.
Cole, W. C.	Lyonville, 1873.
Collaway, George,	Tuscola, 1877.
Cook, E. P.	Mendota, 1868, 72, 76, 77.
Coolidge, Chas.	Warsaw, 1856.
Cooper, Chas. N.	Batavia, 1880.
Cooper, E. H.	Henderson, 1873.

Cooper, E. S.	Peoria, 1854.
Corkins, P. G., (M.I.)	1854.
Cowen, R. S., (E.P.M.)	1873.
Cox, G. W.	Clayton, 1872.
Crane, A. J.	Decatur, 1863.
Crawford, S. K.	Monmouth, 1873, 77.
*Crist, D. L.	Bloomington, 1865, 67, 71, 73. (d. 1875.)
Crothers, E. K.	Bloomington, 1857.
Crouse, D. F. (E.P.M.)	Mt. Carroll, 1863.
Curtis, J. B.	Decatur, 1859.
Curtis, Lester,	Chicago, 1876, 77.
Cuthbert, Wm. L.	Monmouth, 1873.
Danforth, Isaac N.	Chicago, 1877.
Darrah, Alex. Taylor,	Tolono, 1877.
Davis, Frank H.	Chicago, 1876, 77, 78. (d. 1880.)
Davis, N. S.	Chicago, 1850, 51, 53, 54 V.P., 55, 56, 58, 59, 60, 63, 64 P., 65 P., 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 77, 78, 79.
Davis, Wm. Henry,	La Salle, 1854.
Davison, J. B.	Moline, 1873, 77.
Day, Ebenezer,	Grand Tower, 1878.
Day, W. C.	Palmyra, 1873.
Day, W. S., (E.P.M.)	1873.
Demming, H. H.	Pana, 1873.
*De Witt, M. F.	White Hall, 1863.
Dexter, Ransom, (E.P.M.)	Chicago, 1877.
Dickinson, Edw.	Peoria, 1850, 56.
Dodge, David, (E.P.M.)	Chicago, 1863.
Dord, James W.	Mattoon, 1873, 76, 77, 79.
Dougall, William,	Joliet, 1877.
Dubler, W. H.	Windsor, 1877.
Duffield, E. J., (E.P.M.)	Woodstock, 1863.
Du Hadway, C.	Jerseyville, 1877.
Dunning, Cas. W.	Cairo, 1877.
Durham, Henry, (E.P.M.)	La Salle, 1863.
Dyas, W. G.	Chicago, 1877.
Earle, Chas. W.	Chicago, 1877.
Earle, Silas (E.P.M.)	Onarga, 1863.
Edmiston, T. K.	Clinton, 1857, 63.
Edwards, W. G.	Alton, 1848.
Elrod, E. B.	Oskaloosa, 1878.
Ensign, William O.	Rutland, 1877.
Etheridge, J. H.	Chicago, 1877.
Evans, C. H.	Cairo, 1873.
Evans, John,	Chicago, 1849, 50.
Evans, W. S., (M.I.)	1854.
Everett, J. F.	Dixon, 1877.
*Everett, S. W.	Quincy, 1856. (d. 1862.)
Ewing, John,	Monmouth, 1873, 76, 77.
Felker, J. B.	Amboy, 1875, 76, 77.
Fink, Isaac W.	Hillsboro', 1876.
Firey, John J.	Taylorsville, 1873.
Fisher, Alexander,	Chicago, 1863, 64, 71, 73, 77.
Fisher, C.	Jacksonville, 1873.
Fisher, T. D.	Le Roy, 1863.
Fitch, Graham N., (M.)	Chicago, 1852.
Fitch, L. P., (M.I.)	1863.
Fitch, M., (M.I.)	Chicago, 1877.
Fitch, Thomas D.	Chicago, 1856, 59, 63, 67, 69, 70, 74, 76, 77.
Fitch, W. H., (M.I.)	Rockford, 1877.

Foott, D. E.	Belvidere, 1858, 63, 67.
Foster, Addison.	Chicago, 1877.
Foster, J. H., (M.I.)	Libertyville, 1863.
Fox, G. M.	Lyons, 1863.
Fox, W. R., (E.P.M.)	Wilmington, 1863.
Frazier, J. V.	Viola, 1876.
*Freer, Joseph W.	Chicago, 1855, 56, 59. (d. 1877.)
Frye, Joseph C.	Peoria, 1847, 53, 67, 72.
Galt, Thomas,	Rock Island, 1877.
Gardner, E. C., (E.P.M.)	Vermont, 1863. (d. 1870.)
Gaylord, Edwin,	Chicago, 1874.
Gill, H. Z.	Jerseyville, 1876.
Golliday, H. P., (M.I.)	Lacon, 1854.
Goodbrake, Christopher,	Clinton, 1856, 58, 59, 60, 67, 76, 80.
Goodwin, A. E.	Rockford, 1876, 77.
Gorham, Charles,	1863.
Graham, David W.	Chicago, 1877.
Graham, J. N.	Chicago, 1859. (d.)
Gray, E. W.	Bloomington, 1873, 74.
Gray, John B., (M.)	1854.
Green, George (M.)	1877.
Gregg, Patrick,	Rock Island, 1856, 60.
Groesbeck, Abraham,	Chicago, 1869.
Gunn, Moses,	Chicago, 1874, 77, 78 V.P., 79.
Guth, Israel J.	Peoria, 1872, 73.
Guthrie, H. R.	Sparta, 1880.
Hains, W. S., (E.P.M.)	Chicago, 1877.
Hall, Geo. W.	Carthage, 1857, 63.
Haller, F. B.	Vandalia, 1859, 63, 73, 76.
Hamill, R. C., (E.P.M.)	Chicago, 1863, 64, 67, 73, 77.
Hamilton, John B., (M.)	Kane, 1873.
Hamilton, John L.	Peoria, 1875.
Hamilton, Joseph Armond,	Jerseyville, 1867, 69, 70, 71, 72, 73, 75.
Hamilton, S. M., (E P.M.)	Monmouth, 1877.
Hamilton, Wm.	Galesburg, 1873. (d)
Hamilton, W. R.	Peoria, 1850.
Hard, Abner,	Aurora, 1858, 77, 80.
Hard, C.	Ottawa, 1856.
Harper, H. F., (C.)	Merton, Ind., 1876.
Harriman, H. C.	Jerseyville, 1856. (d. 1863.)
Harrington, W. C., (E.P.M.)	Payson, 1854, 56.
Harwood, J. M.	Mt. Auburn, 1867.
Haskell, Wm. A.	Alton, 1877.
Hatch, Ira,	Chicago, 1863.
Hatfield, Marcus W., (M.I.)	Chicago, 1877.
Haven, Samuel R.	Chicago, 1852, 63.
Hay, Walter (E.P.M.)	Chicago, 1863.
Hays, Jacob,	Bridgeport, 1875.
Hensley, John W.	Yales City, 1870, 73.
Herrick, J. B.	Vandalia, 1848 (d. 1849.)
Herrick, W. B.	Chicago, 1854. (d. 1865.)
Herriott, E. L.	Grafton. 1873.
Herse, A. W.	Joliet, 1877.
Hess, Smith H.	Quincy, 1873.
Hess, T. M.	Horner, 1877.
*Hewins, L. T., (M.I.)	Loda, 1863, 65, 67. (d. 1873.)
Hewitt, Geo. W.	Franklin Grove, 1871, 72, 73, 74, 75, 76, 77, 78.
Heydock, M. O.	Chicago, 1863, 64, 77.
Hickman, Thomas Gidion,	Vandalia, 1869.
Hildreth, Joseph A., (M.)	Chicago, 1868.

Hildreth, Joseph S.	Chicago, 1867. (d. 1869.)
Hills, W. A.	Hillsboro. 1857.
Hinkle, J. R., (C.)	Sullivan, Ind., 1876.
Hinkle, John M., (C.)	Carlisle. Ind., 1859.
Hinsey, Joseph C.	Pekin. 1854.
Hitchcock, Horatio, (E.P.M.)	Chicago, 1863.
Hobbs, J. C. H.	Galena. 1857.
Holliday, W. S.	Monmouth. 1875, 77.
Hollister, John H.	Chicago, 1856, 59, 63. 73, 77, 78.
Hollowbush, J. W., (E.P.M.)	Warsaw, 1873. (d. 1877.)
Holmes, E. L.	Chicago, 1863, 77.
Holtz, Fernand C., (M.)	Chicago, 1877.
Hood, H. H.	Litchfield, 1873.
Hume, S. T.	Geneseo, 1863.
Hunt, C. C.	Dixon, 1880.
Hurd, Henry Sterling,	Galesburg. 1860. 69, 70.
Hurlbut, H. N., (E.P.M.)	Chicago, 1863. 77.
Hurlbut, Vincent L. (E.P.M.)	Chicago, 1863, 66, 71, 73, 75, 77.
Hutchinson, James M.	Chicago, 1877.
Hyde, James Nevins,	Chicago, 1877.
Ingals, E. Fletcher,	Chicago, 1877.
Ingersol, Ellen,	Canton, 1878.
Isham, Ralph N.	Chicago, 1859, 63, 72, 77.
Jackson, A. Reeves,	Chicago. 1877.
Jenks, Daniel S.	Plano, 1874.
Jennings, Thomas C.	East St. Louis, 1873.
Johnson, Charles,	York, 1859.
Johnson, Charles B.	Tolano, 1877.
Johnson, Hosmer A.	Chicago, 1854. 59, 60, 63, 64, 67, 73, 74, 75, 77, 79.
Johnson, J. Perrin,	Peoria, 1875.
Johnson, M. J.	Wilmington, 1863.
Johnson, Wm. John,	Chicago, 1869.
Jones, B. B.	Monticello, 1873.
Jones, Geo. Wheeler,	Danville, 1873, 76, 77.
Jones, H. Webster, (E.P.M.)	Chicago, 1863, 76, 77.
Jones, M. O.	Chicago, 1877.
Jones, Samuel J.	Chicago, 1868, 70, 77, 80.
Kaull, William M.	Princeton, 1877.
Kellog, George, (M I.)	Chicago, 1877.
Kendall, Henry W. (M.I.)	Quincy. 1854, 72, 73, 74, 77.
Kennear, A. H., (M.)	1877.
Kilgore, J. C.	Little York. 1873.
King, Joseph, (M.I.)	Decatur, 1854.
King, Joseph S., (E.P.M.)	Lamont, 1863.
Kinkaid, S. W., (M.I.)	1854.
Kirwan, Philip	Ottawa, 1856.
Knox, J. S., (E.P.M.)	Chicago, 1877.
Knox, Wm. A.	Chicago, 1856. 71, 72.
Kohl, Julius,	Belleville, 1873.
Lake, J. J.	De Witt, 1863.
Landon, Wm. M.	Burton. 1873.
Lardner, E. C.	Vermont, 1863.
Lattimer, C. C.	Princeton, 1863.
Ledlie, J. K.	Pittsfield, 1878, 80.
Lewis, B. S.	De Witt, 1857.
Lichty, Daniel, (E.P.M.)	Rochell, 1873.
Link, John E.	Terre Haute, 1877.
Linn, W. S.	Hancock, 1854, 74, 76, 77, 78, 80.
Littlefield, H. H.	Beardstown, 1875, 77.

*Long, Samuel,	Springfield, 1854. (d. 1863.)
Lovewell, C. H.	Englewood. 1880.
Lucas, Geo. L.	Peoria, 1873.
Luce, A. H.	Bloomfield, 1855, 56, 57, 58, 59.
Lyman, J. B.	Rockford, 1877.
Lyon, G. Gallatin,	Jerseyville, 1867. (d.)
McAllister, John, (E.P.M.)	Chicago. 1863. 67.
McArthur, A. L.	Joliet, 1856. 60, 64, 65, 71, 72.
McClelland, M. A.	Knoxville, 1873.
*McCord, D. O.	York, 1859. (d. 1874.)
McDill, David,	Biggsville, 1876.
McLanahan, J. P.	Norwood, 1871.
McLean, John,	Duquoin, 1877, 78.
McMann, W. W.	Gardner, 1874
McNary, W. H.	Martinsville, 1878, 79.
McKown, J. M.	Arcola, 1875.
McVery, Richard E.	Waverly, 1864.
McWilliams, S. A., (E.P.M.)	Chicago, 1877.
Madden, Z. H.	Clinton, 1858.
Marshall, N. S.	Richland, 1878.
Marshall, Wm. Scott,	Centralia, 1877.
Massie, Wm.	Paris, 1867.
Matthews, John P.	Carlinsville, 1877.
Maus, W. S., (E.P.M.) (M.)	1854.
Maxwell, Thomas J.	Briggsville, 1876.
Mead, Edward, (M.)	Chicago, 1846, 50.
Merriman, A. L. (M.I.)	Sandwich, 1863.
Meyer, Theo.	Belleville, 1873, 78.
Miller, A. J.	Paris, 1872, 73.
Miller, De Laskie,	Chicago, 1856, 78.
Miller, Truman W., (M.I.)	Chicago, 1877.
Miller, W. G., (M.I.)	Rockfort, 1863.
Mitchell, J. D.	Terre Haute, 1875.
Mitchell, R. J., (E.P.M.)	Girard, 1873.
Monroe, George J.	Leland, 1873, 74.
Montgomery, Liston H. (E.P.M.)	Chicago, 1877.
Moon, O. W.	Braceville, 1874, 77.
Moore, Enoch W.	Decatur, 1866.
Morse, J. M.	Galesburg, 1873. (d.)
*Nance, Hiram,	Kewanee, 1854, 59, 63, 69, 70, 73, 77.
Nelson, D. T., (E.P.M.)	Chicago, 1877.
Nesbitt, G. W.	Sycamore, 1878, 79, 80.
Nicholas, Adams, (M.)	1853, 54.
Newcommer, J. W.	Petersburg, 1877, 80.
*Noble, Harrison,	Heyworth, 1856, 58, 59, 63. (d. 1870.)
*Noble, S. W.	Bloomington, 1855, 63, 67. (d. 1871.)
Owens, John E., (E.P.M.)	Chicago, 1877.
Paddock, S. A.	Princeton, 1854.
Page, John L.	Chicago, 1858.
Palmer, A. B.	Chicago, 1853, 54, 56.
Paoli, Gerhardt C.	Chicago, 1863, 67.
Park, Roswell,	Chicago, 1877, 78.
Parker, Henry,	Chicago, 1856.
Parker, M. (E.P.M.)	Chicago, 1863.
Parkes, Chas. T.	Chicago, 1877.
Parks, C. R.	Bloomington, 1863.
Parks, Charles G. (E.P.M.)	Chicago, 1877.
Pashley, John S.	Osceola, 1863.
Patterson, Niles P., (E.P.M.)	Chicago, 1863.
Patterson, R. J.	Batavia, 1877.
*Payne, F. R.	Marshall, 1867. (d. 1873.)

Pearman, J. T.	Champaign, 1875, 76.
Peck, B. S.	Galva, 1877.
Penniman, A. B.	Woodburn, 1877.
Perry, B. J.	West Jersey, 1877.
Perry, Joseph,	Crete, 1863.
Phillips, E. L.	Galesburg, 1874, 77.
Phillips, J., (M.I.)	1854.
Pierce, Wm. P.	Lemont, 1874, 77.
Pierson, Daniel,	Augusta, 1863.
Pitner, Thos. J.	Jacksonville, 1872, 73.
Plummer, Samuel C.	Rock Island, 1873, 74, 76, 77.
Polk, John L., (E.P.M.)	Arcola, 1873, 74, 77.
Powell, Edwin,	Chicago, 1873, 77.
Price, Curtis Ethelbert,	Abingdon, 1859.
Prince, David,	Jacksonville, 1854, 56, 63 v.p., 64, 72, 73.
Quigley, Wm. C.	Chicago, 1854.
Quine, W. E., (E.P.M.) (M.)	Chicago, 1877.
Ragan, Gillum T.	Neoga, 1873, 75.
Ralston, J. N.	Quincy, 1854.
Ranch, John H. (M.I.)	Chicago, 1875, 77, 78, 79.
Rankin, A. C.	Loda, 1876, 77.
Rankin, C. D.	Peoria, 1863.
Ray, J. E.	Chicago, 1867.
Read, N. S.	Chandlerville, 1873.
Reber, Chas. T.	Shelbyville, 1877.
Reece, Madison,	Abingdon, 1873, 77.
Reynolds, Albert,	El Passo, 1877.
Rhoads, Geo. W.	Shelbyville, 1873.
Richey, S. O., (E.P.M.)	Chicago, 1877.
Richings, C. H.	Rockford, 1872, 77.
Robbins, H. C., (E.P.M.)	Newark, 1863
Roberts, Jas.	Carbondale, 1876.
Robinson, Joseph,	Quincy, 1865, 67, 73.
Robinson, Wm., (M.I.)	Dover, 1854, 55, 63.
Rockwell, Chas. V.	Taylorsville, 1873.
Rogers, Thomas P.	Bloomington, 1854.
Rohr, G. W.	Rockford, 1877.
Roller, E. O. F., (E.P.M.)	Chicago, 1877.
Roman, James A., (M.)	1854.
Rood, J. B.	Lemont, 1876, 77.
Roskoten, Robert,	Peoria, 1874.
Ross, Joseph P.	Chicago, 1863, 64, 73, 77.
Rouse, Rudolphus,	Peoria, 1848, 53, 54, 55, 56, 63.
Runch, J. H., (M.)	Chicago, 1858.
Rutter, Charles L., (E.P.M.) (M.)	Chicago, 1877.
Samuel, J. B., (E.P.M.)	Carrollton, 1863.
Sanders, Samuel F.	Good Hope, 1875, 76.
Sanford, John F., (M.)	Rock Island, 1849.
Saunders, A. L., (M.)	1876.
Sawyer, E. W., (E.P.M.)	Chicago, 1877
Schaeffer, Fred. C., (M.I.) (M.)	Chicago, 1877, 78.
Secord, Van-Courtland, (E.P.M.)	Galva, 1863.
Sedgwick, W. W., (E.P.M.)	Sandwich, 1863.
Seely, Thadeus, P.	Chicago, 1877.
Sharon, J. K., (M.I.)	1854.
Shepherd, M.	Peyson, 1850, 54, 72, 77.
Shumway, C. W., (E.P.M.)	Chicago, 1863. (d.)
Silverthorn, L. L.	Charleston, 1873, 76, 77.
Simmons, C. J., (E.P.M.) (M.)	Chicago, 1877.
Skilling, D., (M.I.)	Winchester, 1854.

Smiley, J. C., (M)	1877.
Smith, Charles Gilmore,	Chicago, 1864, 77, 80.
Smith, John B.	Golconda, 1876.
Smith, Orin,	Chicago, 1863. (d. 1867.)
Snelling, J. R.	Peoria, 1867.
Spalding, J. W., (M.)	1854.
Spitler, A.	Carthage, 1863.
Stahl, Adam,	Quincy, 1854.
Stahl, Daniel, (M)	Quincy, 1854.
Steele, D. A. K., (E.P.M.) (M.)	Chicago, 1877.
Steele, E A.	Marshall, 1863. (d.)
Stevens, Sarah H.	Chicago, 1876, 77.
Stewart, A. E.	Bloomington, 1859.
Stipp, George W.	Bloomington, 1854.
Stoumont, D. W.	Grand View, 1858.
Stout, Joseph,	Ottawa, 1854, 55.
Sullivan, J. C.	Cairo, 1873.
Tenbroeck, John,	Paris, 1867.
Tenbroeck, S. B.	Paris, 1867. (d.)
Ten Brook, John,	Paris, 1863.
Terry, A. R.	Joliet, 1863.
Thomas, Granville S.	Joliet, 1863.
Thompson, L. G., (M.I.)	1854.
Thompson, Samuel,	Albion, 1850, 54. (d. 1872.)
Tibbetts, L. P.	Cottage Hill, 1863.
Tibbits, S., (E.P.M.)	Kirkwood, 1877.
Tobey, Robert,	Blue Mound, 1877.
Todd, J. F.	Galva, 1877.
Todd, L. L.	Paris, 1872, 73.
Travers, E. R.	Amboy, 1874, 77.
Trowbridge, S. T.	Decatur, 1854, 56, 67.
Truesdale, Calvin,	Rock Island, 1863, 77.
Tucker, D. M.	Chicago, 1863.
Van Horne, A. K.	Jerseyville, 1873, 76, 80.
Varin, Wm.	Chicago, 1856.
Vosburg, D. M.	Earlville, 1872.
Wadsworth, J. L. R.	Collinsville, 1873.
Walker, James R.	Cutler Station, 1877.
Wallace, Jas. H., (E.P.M.)	Monmouth, 1877.
Walton, M. W.	Ridott, 1872, 74, 76.
Wanzer, Hiram, (E.P.M.)	Chicago, 1863.
Warden, Horace,	Cairo, 1869, 73, 76, 77, 80.
Warner, L. F., (E.P.M.)	Chicago, 1863.
Washburn, Thomas D.	Lawrenceville, 1854.
Webster, John R.	Monmouth, 1873, 77.
Welch, Wm. W.	La Salle, 1854.
Wells, Ira R.	Geneseo, 1873.
White, Charles, (?)	Chicago, 1863.
White, Francis W.	Chicago, 1858.
White, John L.	Bloomington, 1873.
Whitley, Jas. D.	Oakford, 1880.
Wickersham, Swayne,	Chicago, 1858, 63, 72.
Wilbur, C. T.	Jacksonville, 1873.
Wilder, Flavius M., (E.P.M.)	Chicago, 1874, 77.
Wilkins, Thomas,	Vandalia, 1859.
Willard, E. R.	Wilmington, 1872, 73, 76, 77, 78.
Willard, G. E.	Chicago, 1878.
Williams, Hezekiah, (M.I.)	Alton, 1853.
Williams, Hezekiah, Jr.,	Alton, 1856.
Williams, John S.	Otter Creek, 1873.
Willien, L. J., (C.)	Terre Haute, Ind., 1875.

Wing, Henry,	Chicago, 1863.
Winslow, L. A.	Aurora, 1877.
Wood, William,	Cairo, 1854.
Worrell, T. F.	Bloomington, 1863.
Wright, John,	Clinton, 1867, 73.
Wright, N.	Chatham, 1863, 64.
*Young, D. H.	Aurora, 1859. (d. 1874.)
Yerkes, T. P.	Upper Alton, 1876.
Zimmerman, C. A. W., Jr.,	Quincy, 1873.

INDIANA.

Adams, J. R.	Petersburg, 1879.
Ader, Henry,	Somerset, 1875, 77.
Adrion, James A.	Logansport, 1871, 75, 77.
Aitken, F. M.	Bristol, 1877.
Allen, J. W.	Elkhart, 1874.
Andrew, George L.	La Porte, 1853, 77.
Arnold, John	Bushville, 1875. 77.
Austin, T. R.	New Albany, 1859.
Ayers, S C.	Fort Wayne, 1867.
Ayres, H. P.	Fort Wayne, 1856, 59, 67, 74.
Bacon, C. P.	Evansville, 1874. 75.
Barker, Jesse T.	Brownsburg, 1877.
Barton, G. G., (M.I.)	Washington Co., 1864.
Beard, F. W.	Corydon, 1859, 72, 73, 75.
Beasley, George F.	La Fayette, 1867, 78.
Beck, John C.	Cadiz, 1858, 59.
Beck, Joseph R.	Fort Wayne, 1873, 74, 75, 76, 77, 78, 79, 80.
Bell, Wm. H.	Logansport, 1874, 77, 78, 80.
Berry, Alfred F.	River Vale, 1874, 75.
Biglow, A. A.	Attica, 1859.
Bitz, L. B.	Blairsville, 1878.
Blount, R. F.	Wabash, 1875.
*Bobbs, J. S.	Indianapolis, 1867 (d. 1870.)
Bonnell, M. H.	Lebanon, 1877, 78, 79.
Boor, Walter A., (M.)	1875
Bowan, B. C., (M.I.)	1859.
Bowman, Charles,	New Albany, 1859.
Boyd, S. S.	Dublin, 1856, 59, 77, 79.
Boynton, S. G.	Elizabethtown, 1859.
Bradbury, A. B.	Milton, 1867.
Brelsford, Joseph,	Plymouth, 1856.
Brenton, Wm. H.	Peru, 1877.
Brill, Jas. H.	Pittsboro, 1876.
Brower, J. H.	Lawrenceburg, 1859.
Brown, C.	Indianapolis, 1859.
Brown, J. H., (M.I.)	Lawrenceburg, 1850.
Brownback, O. W.	Pendleton, 1876.
Brueback, George T.	Fort Wayne, 1875, 77, 78.
Bryant, J. H.	Huntingburg, 1875.
Buchlell, J. B., (E.P.M.)	South Bend, 1863. (d. 1870.)
*Bullard, Talbot,	Indianapolis, 1857, 59. (d. 1863.)
Burket, C. W.	Warsaw, 1877, 79.
Burr, C. S.	Anderson, 1880.
Burton, Geo. W.	Mitchell, 1874.
Butler, A. B.	Richmond, 1859. (d.)
Butterfield, W. W.	Indianapolis, 1876.
Byford, Wm. H.	Evansville, 1854, 57 V.P.

Cady, W. F.	La Fayette, 1873.
Cameron, R. A.	Valparaiso, 1856, 58.
Cary, H. G.	Indianapolis, 1864.
Casebear, J. B.	Auburn, 1877.
*Casselberry, Isaac,	Evansville, 1859, 73. (d. 1873.)
Center, George F.	Evansville, 1875.
Chambers, John,	Indianapolis, 1877.
Charlton, S. H., (M.I.)	Seymour, 1875, 76, 77.
Chase, Harvey H.	Salem, 1875.
Clapp, Asahel,	New Albany, 1850, 59. (d. 1862.)
Clapp, W. A.	New Albany, 1853, 59.
Clark, Dugan,	Richmond, 1873.
Clark, H. A.	Fort Wayne, 1877.
Clark, Haymond W.	Noblesville, 1874, 75, 77.
Cogley, T. J.	Madison, 1858.
Cole, H. C., (M.)	Kokoma, 1867, 80.
Coleman, Asa,	Logansport, 1876, 77.
Collings, S. P.	Indianapolis, 1874, 75.
Collins, Wm. A., (M.I.)	Madison, 1875.
Cominger, John A.	Indianapolis, 1872, 77.
Cornett, W. T. S.	Versailles, 1859.
Cowan, John A.	Auburn, 1873, 74.
Craighead, R. D.	Indianapolis, 1874.
Crain, M. F.	Angola, 1877.
Crandall, R. O.	Laporte, 1863.
Cravens, T. A.	Bloomfield, 1875.
Crim, L. A.	Tunelton, 1875.
Crippen, E. H.	Moscow, 1873, 75, 76.
Cummings, David J.	Houston, 1875, 77.
Curren, B., (M.I.)	Jeffersonville, 1859.
Darnall, M. D.	Bainbridge, 1856.
Davenport, T.	Warsaw, 1877.
Davis, John W., (M.I.)	Carlisle, 1859.
Davis, R. P.	Redkey, 1875.
Davis, S.	Columbus, 1859.
Davis, W. H.	Indianapolis, 1878.
Davison, J. H.	Warsaw, 1877, 78, 79.
Dayton, Geo. H.	Lima, 1880.
Dean, H. K., (E.P.M.)	Mauckport, 1863.
*De Bruler, J. P.	Evansville, 1867, 71. (d. 1874.)
Denny, D. W. C.	Ligonier, 1867.
De Forest, D. A.	Boonville, 1879.
Dicken, James S.	Somerset, 1856.
Dickey, William,	Centerville, 1850, 59.
Dills, Thomas J.	Fort Wayne, 1875, 76, 80.
Dodge, J. Shaw,	Bristol, 1879.
Dryden, F. F.	Clayton, 1877.
Eastman, Joseph,	Brownsburg, 1873, 75, 80.
Eichalberger, ——, (E.P.M.)	Terre Haute, 1877.
Elliott, Cyrenius,	Wadesville, 1875.
Elstun, W. J.	Indianapolis, 1875.
*Emanuel, A. D., (C.)	Antwerp, Ohio, 1875, 76. (d. 1876.)
Erwin, A. J.	Fort Wayne, 1863, 67.
Fenton, D. W.	Ray, 1877.
Ferris, A. B.	New Paris, 1863.
Field, Nathaniel,	Jeffersonville, 1873.
Fishback, Charles,	Shelbyville, 1859. (d. 1861.)
Fisher, Elias,	Richmond, 1867.
Fitch, Graham N., (M.I.)	Logansport, 1858, 77, 79, 80.
Fletcher, Wm. B.	Indianapolis, 1865.

Florer, Thomas W.	Almo, 1855.
Franklin, Thomas M., (M.I.)	1856.
Freeman, S. A.	Fort Wayne, 1863.
Friermood, Ezra K.	North Grove, 1875.
Gerrish, James W. F.	Seymour, 1875, 76, 77, 79.
Gifford, Thomas, (M.) (?)	Laurel, 1867.
Glazebrook, L. D., (M.I.)	1863.
Graham, W. B.	Noblesville, 1875.
Gray, J. M.	Noblesville, 1875.
Gray, John M.	Bloomfield, 1875.
Green, J. N.	Stilesville, 1859
Gregg, James S.	Fort Wayne, 1873, 74, 75, 76, 77, 78, 79.
Gregg, S. S.	Fort Wayne, 1867.
Guley, H. G., (M.I.)	1846.
Haggerty, Robert J.	Elkhart, 1874, 75, 77.
Haggerty, Robert Quin,	Elkhart, 1877, 78, 79.
Ham, Levi J.	South Bend, 1866.
Hamilton, A. A.	Hoboken, 1877.
Handley, Edwin, (M.)	1867.
Hani, W. H.	Middleburg, 1878.
Hanna, W. M.	New Harmony, 1873.
Harding, M. H.	Lawrenceburg, 1859, 67, 71, 75, 76, 77.
Harper, H. F.	Miron, 1877.
Harriman, S. B.	Richmond, 1867.
Hartley, John D.	Fort Wayne, 1874.
Harvey, Thos. B.	Indianapolis, 1867, 72, 76, 77.
Haughton, R. E.	Richmond, 1859, 67, 72.
Haymond, Rufus,	Brookville, 1850.
Hays, G. C.	Hillsboro, 1880.
Helm, John H.	Peru, 1871, 73, 74, 75, 77, 78, 79.
Henley, Alpheus,	Fairmount, 1877.
Hess, Luther P.	Marion, 1877.
Hibbard, James F.	Richmond, 1863, 64, 65, 66 V P., 67, 68, 69, 70, 71, 76, 77, 78, 79, 80.
Higday, T.	Laporte, 1863.
Hilliard, John F.	Evansville, 1871.
Hinkle, J. R.	Sullivan, 1877.
Hitt, Willis W.	Vincennes, 1854, 57, 59, 60.
Hobbs, Marmaduke W.	Richmond, 1877.
Holton, Wm. M.	New Harmony, 1879, 80.
Hon, Benton J.	Orleans, 1875.
Hoopengarner, J. J.	Butler, 1877.
Howard, N. P., Jr.	Greenfield, 1880.
Humphreys, Louis, (M.I.)	South Bend, 1856, 58, 74, 75, 76, 77, 78.
Hutchinson, David,	Moorsville, 1856.
Insley, W. Q.	Terre Haute, 1877.
Iutzi, Joseph,	Richmond, 1878.
Jameson, Henry,	Indianapolis, 1875, 80.
Jenis, Samuel,	New Castle, 1863.
Jessup, D. H.	Rising Sun, 1859.
Jewett, Luther, (M.I.) (M.)	1850.
Johnson, H. V. V.	Indianapolis, 1850.
Johnson, Nathan,	Cambridge City, 1850, 57.
Jones, Caleb V.	Covington, 1877.
Jones, D. M.	Corydon, 1859.
Jones, H. G.	Evansville, 1875, 79.
Keen, L. S.	Laporte, 1878, 80.
Kennedy, Leroy H.	Belleville, 1859.
Kersey, Verline,	Milton, 1853.

Kimberlin, H. L.	Mitchell, 1875.
Kitchen, John M.	Indianapolis, 1859, 74, 75.
Knepper, E. W.	Lyoneer, 1874, 77, 78.
Knight, J. H.	Paragon, 1877.
Kyle, T. M.	Manchester, 1877.
Lane, Thomas H.	Lebanon, 1878, 79.
Larimer, B.	Millersburg, 1876.
Latta, M. M.	Goshen, 1848, 55, 76.
Laughlin, E. D.	Orleans, 1875.
Leavitt, ——, (E.P.M.) (M.)	Terre Haute, 1877.
Leech, Thomas F.	Attica, 1875, 77, 78.
Leedy, J. K.	Warsaw, 1850.
Leonard, S. E.	New Albany, 1850. (d.)
Leonard, W. Y.	Albion, 1867.
Lewis, Walter H.	Pendleton, 1877.
Link, John E., (M.I.)	Terre Haute, 1875, 79.
Linthicum, E.	Evansville, 1875.
Linton, S. M., (M.I.)	Columbus, 1859, 75.
Linville, D. G.	Columbia City, 1867, 74, 76.
Lockhart, Wilson,	Indianapolis, 1866.
Lomax, Constantine,	Marion, 1876, 77.
Lomax, William,	Marion, 1850, 53, 67, 74, 75, 76, 77, 79, 80.
Long, John H., (M.)	1877.
Lowder, L. T.	Harrodsburg, 1875, 77.
Lyons, J. E.	Huntingdon, 1867, 72.
Lyons, W. B.	Huntingdon, 1856.
McCarthy, G. F., (M.I.)	1856.
McCarthy, J. F.	Valparaiso, 1873, 74, 77.
McDonald, W. B.	Indianapolis, 1875, 76.
McIntire, E. S.	Mitchell, 1867.
McIntyre, John H.	Richmond, 1873, 79.
Maclean, Geo. M.	New Albany, 1853.
McMahan, W. R.	Huntingburg, 1875, 79.
McNabb, Theodore,	Fremont, 1874, 76.
McPheeters, Alexander,	Lavonia, 1859, 60.
Mantle, John R.	Vincennes, 1860.
Markle, John E.	Winchester, 1878.
Martin, Samuel M.	Greenfield, 1878.
Martin, W. H.	Rushville, 1850.
Mauzy, R. D.	Rushville, 1859, 73.
Mavity, W. K.	Kokoma, 1874, 75.
Maxwell, James D.	Bloomington, 1859.
May, W. L.	Crawfordsville, 1878.
*Mears, George W.	Indianapolis, 1850, 67, 71, 72, 75. (d.)
Meek, John A., (E.P.M.)	Jonesboro, 1877.
Meeker, Daniel,	Laporte, 1848, 49, 56.
Mendenhale, Isaac,	Ashland, 1857, 59, 72, 77.
Mendenhall, Nathan,	Thornton, 1875.
Miller, C. B.	Lawrenceburg, 1875.
Mitchell, J. D.	Terre Haute, 1877.
Moffett, John,	Rushville, 1859, 66, 67, 77.
Montgomery, D. B.	Cynthiana, 1878.
Montgomery, H. T.	Wakarusa, 1878.
Morgan, Daniel,	Evansville, 1854, 59.
Morris, J. E.	Liberty, 1876.
Motherhead, F. M.	Indianapolis, 1859.
Motherhead, J. L.	Indianapolis, 1850, 54.
Mullen, A. J.	Napoleon, 1850, 59, 67, 72.
Mullen, B. F., (M.I.)	1850.
Mumford, S. E.	Princeton, 1875.

Murphy, Edward,	New Harmony, 1854, 55, 58, 73, 75, 76, 77.
Myers, William H.	Fort Wayne, 1865, 67, 72, 73, 74, 75, 77.
New, George W.	Greensburg, 1859.
Newcomer, F. S.	Indianapolis, 1880.
Newland, Benjamin,	Bedford, 1859, 73, 75, 76, 77, 79.
Newland, J. W.	Bedford, 1875, 77.
Orr, James P.	Rushville, 1879.
Owen, Abram M., (M.I.)	Evansville, 1879, 80.
Parr, W. P.	Indianapolis, 1865.
Parry, Charles,	Indianapolis, 1850.
Parvin, Theophilus,	Indianapolis, 1868, 72, 73, 74, 75, 76, 77, 78 P., 79.
Patterson, A. W.	Indianapolis, 1875.
Patterson, R. J.	Indianapolis, 1850.
Pearse, S. H.	Mt. Vernon, 1875, 78.
Peck, C. F.	Leesburg, 1877.
Peck, Samuel W.	Washington, 1875, 76.
Pennington, Joel,	Milton, 1850, 55, 59, 74, 77.
Personett, L. D.	Washington, 1859, 63.
Pollitt, F. M.	Milroy, 1877.
Porter, A. G.	Lebanon, 1877, 79.
Preston, A. G.	Greencastle, 1867.
Pugh, John W.	Oaktown, 1875.
Pugh, Wm. A.	Rushville, 1875.
Purviance, S. W.	Crawfordsville, 1875.
Putt, Franklin L.	Middleburg, 1878.
Ransom, W. C.	Hartford City, 1877.
Raridan, Samuel A.	Bedford, 1875.
Rawlings, Jas. W.	New Harmony, 1873, 75.
Rawlins, F. J. C.	Knightstown, 1867.
Rea, John,	New Castle, 1870, 75.
Read, Ezra,	Terre Haute, 1874.
Reasoner, Harmon D.	New Cumberland, 1876, 79, 80.
Reeder, William,	Corydon, 1859.
Reid, Samuel (M.)	Lavonia, 1859.
Renner, John P.	Lagro, 1877.
Riley, John M.	New Albany, 1859.
Ritter, Levi,	Plainfield, 1858, 59.
Rogers, Joseph Goodman,	Madison, 1867, 69, 70, 73, 75.
Rogers, Joseph H. D.	Madison, 1859.
Ronalds, Hugh,	Evansville, 1853.
Rooker, James J.	Castleton, 1875, 77.
Rose, Landon C.	Laporte, 1853, 56, 77, 78.
Rose, M. H.	Danville, 1867.
Rosenthall, Isaac M.	Fort Wayne, 1867, 74, 75.
Ross, Justin,	Williamsport, 1877.
Rowan, B. G., (M.I.)	Fort Wayne, 1859. (d.)
Rowland, Geo.	Gola Creek, 1867.
Runyan, J. M.	Stockdale, 1874, 75.
Sarber, William,	Palestine, 1855.
Scott, Wm.	Kokoma, 1875.
Sexton, H. G.	Rushville, 1850, 59. (d. 1865.)
Sexton, Marshall,	Rushville, 1867, 74, 75, 76, 77, 79, 80.
Sheets, Levi D.	Liberty, 1856.
Shields, P. S.	New Albany, 1859.
Shipman, Azariah B., (M.)	1846, 47, 48, 49.
Shively, James S.	Marion, 1850.
Shulse, Wm. H.	Lebanon, 1875.
Sloan, John,	New Albany, 1851, 59.
Slocum, Charles E.	Shelbyville, 1878.

Slocum, J. C., (M.I.)	Shelbyville, 1874.
Smith, A. J.	Wabash, 1874, 76.
Smith, H. M.	Vincennes, 1850.
Smythe, Gonsalvo C.	Green Castle, 1879, 80.
Sommes, Joseph,	Vincennes, 1853, 59.
Spann, B. F.	Anderson, 1880.
Spencer, W., (M.I.)	1875.
Spillman, F. J., (M.) (?)	1867.
Spooner, Jarad,	Auburn, 1874, 77.
Spotswood, F. T.	Perrysville, 1873.
Stevens, Thadeus M.	Indianapolis, 1868, 67, 72, 74, 75.
Stevenson, A. G.	Laporte, 1877.
Stewart, W. J., (M.I.)	1850.
Stillson, Jos.	Bedford, 1867.
Stilwell, Joseph A.	Brownstown, 1875.
Stratford, A.	Indianapolis, 1875.
Sullivan, O. H.	Indianapolis, 1873.
Sutton, George,	Aurora, 1856, 59, 67, 68, 71, 72, 73, 74, 75, 76, 77.
*Sutton, Willis E.	Aurora, 1875, 77. (d. 1879.)
Swafford, Benj. F.	Terre Haute, 1877.
Sweeny, T. J.	New Albany, 1859.
Talbert, A. V., (M.I.)	Westfield, 1859.
Taylor, D. W.	Jalapa, 1859.
Teal, Norman,	Kendalville, 1878.
Thacker, W. H.	Fort Wayne, 1867.
Thomas, A. McAd.	La Fontain, 1877.
Thomas, Mary F.	Richmond, 1877.
Thompson, S. W.	Evansville, 1872.
Thompson, W. C.	Indianapolis, 1876.
Todd, R. N.	Indianapolis, 1867, 72, 73, 74, 75, 76, 77, 78.
Tomlinson, Samuel C.	Indianapolis, 1873.
Town, R. R.	New Albany, 1856, 59.
Townsend, J. H.	Hasland, 1865.
Troy, Samuel A.	Milners Corner, 1877, 80.
Vickey, A. M.	Indianapolis, 1863.
Vincent, H. C.	Gilford, 1875, 77.
Vinnedge, W. W., (E.P.M.)	La Fayette, 1873, 74, 75.
Voorhess, G. V.	South Bend, 1878.
Walker, George B.	Evansville, 1879.
Walker, J. C.	Indianapolis, 1875.
Wall, David,	Clermont, 1873, 75.
Waterman, Luther D.	Indianapolis, 1870, 72, 75, 76, 77.
Webber, Irvin B.	Warsaw, 1877.
Webster, John,	Romney, 1880.
Weist, J. R.	Richmond, 1867, 76, 77, 78, 79, 80.
West, Calvin, (M.I.)	Hagerstown, 1856, 57, 58, 59 v.p. (d.)
Wheeler, Wm. A.	Evansville, 1880.
Williams, Lewis,	Marion, 1867, 75, 77, 79.
Willien, Leon J.	Terre Haute, 1874, 77.
Wilson, M. V.	Medora, 1875.
Windle, J. A., (M.I.)	Bluntsville, 1859.
Winton, R.	Muncie, 1879.
Winton, Wm. R.	Wabash, 1856, 59.
Wishard, Wm. H.	Greenwood, 1860.
Wood, H. D.	Angola, 1874, 76, 77, 78, 80.
Wood, Sol. A.	Angola, 1880.
Wood, T. F.	Metz, 1876, 77.
Woodburn, Jos. H.	Indianapolis, 1859, 73, 75.

Woodworth, Benj. Studley,	Fort Wayne, 1856, 59, 63, 66, 69, 73, 75, 76.
Woolen, G. V.	Indianapolis, 1867.
Work, J. A.	Elkhart, 1874, 75, 76.
Worrell, J. P.	Terre Haute, 1876.
Wright, C. H.	North Madison, 1875.
Wright, J. Joel,	Monrovia, 1859.
Yost, J. L. W.	Mitchell, 1877.
Young, Stephen J.	Terre Haute, 1877, 78, 79.
Yount, Silas T.	La Fayette, 1875, 80.
Yuill, Wm. Robert,	Ft. Wayne, 1878.
Zimmerman, G. W.	Cadiz, 1877.

IOWA.

Adler, John M.	Davenport, 1856.
Ady, Albert,	Muscatine, 1877.
Andros, Fred.	McGregor, 1872.
Angear, J. J. M.	Fort Madison, 1873, 76, 77.
Archibald, O. W.	Glenwood, 1877.
Armor, Samuel G.	Keokuk, 1850.
Arnold, Edward A.	Davenport, 1854.
Baker, John W. H.	Davenport, 1860, 63, 73.
Ball, James M.	Waterloo, 1877.
Barrows, Egbert S.	Davenport, 1860.
Baxter, W. H.	Wilton, 1870, 77.
Bean, J. V.	Burlington, 1877.
Bell, John,	Davenport, 1876.
Blackburn, J. C., (M.)	Fort Madison, 1867, 73.
Blackman, Wm. W.	West Mitchell, 1873.
Blakeslee, Edward, (E.P.M.)	Anamosa, 1873.
Boucher, J. H.	Iowa City, 1873. (d. 1874.)
Bowen, A. B.	Maquoketa, 1876, 77.
Bowman, Edward Hale,	Andalusia, 1869.
Bradley, Charles C.	Manchester, 1877, 78.
Brown, Luther, Jr., (M.)	Pottsville, 1877.
Byrnes, Thomas,	Walcott, 1873, 77.
Caldwell, T. J.	Adel, 1876.
Cantwell, A. W.	Davenport, 1872, 77.
Carpenter, A. M.	Keokuk, 1873, 80.
Carpenter, Horace,	Blue Grass, 1860.
Carter, Geo. W.	Marshaltown, 1875.
Cary, L. H., (E.P.M.)	Toledo, 1863.
Chase, S. B.	Osage, 1873, 77.
Clapp, Elmer F.	Iowa City, 1876, 77, 78.
Clark, E. W.	Grinnell, 1877.
Cleaver, H. T.	Keokuk, 1868, 74.
Coolidge, F. W.	Oskaloosa, 1876, 77.
Cowden, J. W.	Belleview, 1874.
Cowen, J. H., (M.)	
Cozard, Jas.	Andalusia, 1876.
Craig, Norman S.	Lansing, 1877.
Crouse, D. W.	Waterloo, 1874, 77.
Davis, Charles W.	Indianola, 1873, 78, 80.
Dean, Henry M.	Muscatine, 1876, 77, 80.
Deering, A. A.	Moingona, 1878.
Dennison, John,	De Witt, 1877.
Dosh, J. R.	Stuart, 1876.
Edwards, Thomas O.	Dubuque, 1858, 59 V.P.
Elbert, John D.	Keosaqua, 1854.

Ely, John F.	Cedar Rapids, 1854.
Ensign, H. D.	Boone, 1878.
Fairchild, David S.	Ames, 1874.
Farnsworth, P. J.	Clinton, 1873, 74, 77, 80.
Field, A. G.	Des Moines, 1867.
Fitch, L. P., (M.)	Charles City, 1876.
Ford, E. R.	Keokuk, 1854.
Fountain, E. J.	Davenport, 1860. (d. 1861.)
Francis, E. C.	Keokuk, 1856. (d. 1856.)
Frost, G. W.	Belleview, 1876.
Galt, Thomas,	Rock Island, 1873.
Gamble, James,	Le Clair, 1875.
Getz, H. L.	Marshalton, 1876.
Grant, W. W.	Davenport, 1873, 76.
Griffin, C. C.	Vinton, 1877.
Gruwell, J. P.	Des Moines, 1873, 76.
Gutch, Wm.	Blakesburg, 1876, 77.
Hamilton, Horace,	McGregor, 1865. (d.)
Hanawalt, G. P.	Des Moines, 1878.
Hazon, E. H.	Davenport, 1872, 73.
Helm, John H., (M.)	1876.
Hillis, D. B.	Keokuk, 1873.
Hinsey, J. C.	Ottumwa, 1874.
Hobart, A. J.	Clinton, 1874.
Horr, Asa,	Dubuque, 1857, 58.
Howell, M. V. B.	Moulton, 1874.
*Huff, Sanford W.	Sigourney, 1877. (d. 1879.)
Hughes, J. C.	Keokuk, 1853, 54, 57, 66, 67 v.p., 71, 73, 74, 77, 78, 79, 80.
Huntsman, H. C.	Oskaloosa, 1873, 77.
Hurst, D. A., (M.)	Oskaloosa, 1873, 76.
Huston, R. W.	Eldon, 1877.
Iles, Thomas J.	Davenport, 1864, 68.
Ireland, A. B.	Camanche, 1874, 76.
Jenkins, Geo. F.	Keokuk, 1873, 80.
Kellogg, Geo. M., (M.I.)	Keokuk, 1867.
Knott, John M.	Sioux City, 1878.
Knox, O. S.	Waterloo, 1877.
Langan, D.	De Witt, 1872, 76, 77.
Langer, J.	Davenport, 1859. (d. 1878.)
Lay, Jas. Cochran,	Dubuque, 1872.
Lay, Samuel C.	Dubuque, 1863.
Lewis, C. G.	Ottumway, 1877.
Lewis, Enoch,	Albian, 1876.
*Lewis, R. S.	Dubuque, 1856. (d. 1869.)
Lothrop, Charles H., (M.)	Lyons, 1873.
Love, J. S.	Springville, 1877.
Lundy, D. W., (M.)	1877.
Lyford, Wm. H., (C.)	Port Byron, Ill., 1873.
McCleary, J. D.	Indianola, 1878, 80.
McCurdy, A. T.	Keokuk, 1864.
McClure, A. W.	Mt. Pleasant, 1873.
McClure, Benjamin,	Dubuque, 1878, 80.
*McGugin, D. L.	Keokuk, 1854, 56, 57, 59, 60, 63, 64. (d. 1865.)
McLean, J. W.	Volga City, 1876.
Malcolm, A. B.	Dubuque, 1849.
Maulsby, M. D.	Brafield, 1876.
Maxwell, A. S.	Davenport, 1873.
Maynard, H. H.	Tipton, 1880.
Meeker, Daniel,	Keokuk, 1859, 60. (d. 1876.)

Meredith, Marion,	Vinton, 1877.
Middleton, Wm. D.	Davenport, 1877.
Moser, P. S.	Boonsboro, 1876.
Mountain, N. W.	Letts, 1877.
Nance, Hiram Irwing,	Custin, 1877.
North, John,	Keokuk, 1877.
Noyes, A. A.	Mason City, 1874, 77.
Osborn, Henry,	Council Bluffs, 1877.
Overholt, D. W.	Columbus, 1876.
Park, W. M.	Indianola, 1880.
Parr, Thomas S.	Indianola, 1879.
Peck, W. F.	Davenport, 1865, 72, 73, 77, 78, 79, 80.
Pierce, S. N.	Cedar Falls, 1877.
Ranche, John H.	Burlington, 1852, 54.
Ransom, Horace B.	Burlington, 1877, 79, 80.
Rawson, Charles H.	Des Moines, 1873, 77.
Reed, A. B.	Cedar Rapids, 1880.
Rice, R. C.	Smithland, 1878, 80.
Ristine, Henry,	Cedar Rapids, 1877.
Roberts, A. C.	Fort Madison, 1871, 73, 74.
Robertson, W. S.	Muscatine, 1873, 78.
Robinson, S. E.	West Union, 1876, 77.
Russell, John H.	Blakesburg, 1877.
Sanborn, J. E.	Keokuk, 1855.
Sanford, John F.	Keokuk, 1854. (d. 1874.)
Sawyers, John L.	Unionville, 1878.
Sawyers, S. H.	Unionville, 1873, 76, 78.
Schermerhorn, W. S	Jefferson, 1880.
Shrader, John C.	Iowa City, 1877.
Siveter, Thomas,	Salem, 1854.
Skinner, G. R., (M.)	1877.
Smith, J. W.	Charles City, 1873, 77, 78.
*Sprague, Joseph,	Dubuque, 1863.
Staples, G. M.	Dubuque, 1872.
Taylor, Morse K.	Keokuk, 1863, 64, 66, 67.
Taylor, T. G.	Wapello, 1876.
Thompson, O. B.	Atlantic, 1876.
Thompson, R. E.	Muscatine, 1873.
Thomson, J. J.	Davenport, 1864.
Thrall, Seneca B.	Ottumwa, 1871, 73, 77.
Undell, N.	Centerville, 1876.
Van Patten, N.	Davenport, 1854.
*Walker, Peter, (M.I.)	Libertyville, 1854. (d. 1863.)
Walton, Wm.	Dubuque, 1876.
Warne, Geo.	Independence, 1880.
Watson, William,	Dubuque, 1857, 59.
Wells, Ira B., (C.)	Geneseo, Ill., 1876.
Whinney, E.	Fort Madison, 1867.
Whitley, John L.	Osage, 1878.
Williams, A. O.,	Ottumwa, 1877.
Williamson, Jefferson,	Ottumwa, 1871, 73, 75.
Witherwax, John M., (M.I.)	Davenport, 1850, 66, 69. (d. 1869.)
Wright, W. T.	Keokuk, 1873.

KANSAS.

Bell, James,	Olathe, 1878.
Carpenter, J. M.	New Lancaster, 1878.
Furley, C. C.	Wichita, 1875.
Hartley, John D.	Newton, 1880.

Kennedy, H. K.	Topeka, 1873.
Lamphear, A. H.	Atchison, 1872.
Lary, A. J., (M.I.)	Mt. Pleasant, 1867. (d. 1875.)
Linley, Jas. M.	Atchison, 1873, 77.
Logan, C. A.	Leavenworth, 1863.
McCabe, D. W.	Wyandott, 1873.
Mottram, C. V.	Lawrence, 1873, 74, 75, 76, 78, 79, 80.
Neely, S. F.	Leavenworth, 1872.
Parsons, John,	Mt. Pleasant, 1867.
Schenck, W. L.	Osage City, 1877.
Shean, Wm. M.	Gardner, 1880.
Sinks, Tiffin, (E.P.M.)	Leavenworth, 1863.
Stormont, D. W.	Topeka, 1863, 71, 73, 76, 77, 78, 80.
Thomas, D. W.	Leavenworth, 1877.
Tremaine, W. S.	Ft. Dodge, 1880.

KENTUCKY.

Allen, H. G.	Tilton, 1875.
Allen, John R.	Lexington, 1854.
Almond, L. E., (M.I.)	Underwood, 1857.
Anderson, N. B.	Louisville, 1859.
Anderson, Turner,	Louisville, 1875.
Annan, Samuel,	Hopkinsville, 1847, 50, 57.
Atchison, W. A.	Bowling Green, 1857, 70, 73.
Atkins, W. F., (M.I.)	Lexington, 1867.
Atkinson, Frank,	Shelbyville, 1874.
Bailey, Jonathan R., (M.I.)	Ferguson Station, 1857, 58, 75, 76, 77.
Bailey, William,	Louisville, 1875, 77.
Bailhache, P. H.	Louisville, 1876.
Baker, J.	Shelbyville, 1875.
Baldwin, Benj. J.	Louisville, 1880.
Bayless, George Wood,	Louisville, 1859, 69. (d.)
Beeler, George,	Clinton, 1868, 73, 76.
Bell, T. S.	Louisville, 1850, 53, 59.
Bemiss, S. M.	Louisville, 1857, 58, 59, 60.
Benson, J. W.	Louisville, 1867.
Berkeley, Hugh, (M.I.)	1859.
Berry, J. T.	La Grange, 1875.
Blackburn, Churchill J.	Covington, 1850, 53, 55, 59, 67. (d. 1868.)
Bodine, J. M.	Louisville, 1867, 72, 74, 75, 76, 77, 78, 79.
*Bradford, J. Tyler, (M.I.)	Augusta, 1855, 58, 67. (d. 1871.)
Brandies, Samuel,	Louisville, 1875, 76.
*Breckenridge, R. J.	Louisville, 1850, 51, 54, 56, 57 V.P., 58, 59, 60. (d. 1867.)
Brooks, J. G.	Paducah, 1875.
Brown, Erasmus O.	Louisville, 1859.
Brown, Hawkins,	Houstonville, 1870, 75, 76.
Brown, M. S , (E.P.M.)	Mt. Olivat, 1874, 75.
Bruce, Jas. S.	Lexington, 1867.
Bryan, Stanton P.	Brownsboro, 1859.
Buckner, G. D.	Lexington, 1875.
Bullitt, O. G., (M.I.)	1854.
Burdett, S. L.	Lancaster, 1873.
Bush, James Miles,	Lexington, 1850, 59, 67, 69. (d. 1875.)
Cain, W. S., (M.I.)	Marion, 1859.
Caldwell, Charles C., (E.P.M.)	Louisville, 1850. (d.)
Caldwell, W. B.	Louisville, 1859.

Callahan, S. J., (M.I.)	1875.
Callaway, A.	Louisville, 1859.
Carr, James A.	Princeton, 1875.
Carter, D. D.	Versailles, 1872, 73, 74, 75.
Cartwright, H. P.	Rich Pond, 1873, 75.
Chambers, Wm. M.	Covington, 1852.
Chipley, W. S.	Lexington, 1857, 59, 67. (d. 1880.)
Cleaver, W. W.	Lebanon, 1859.
Coleman, B. L.	Lexington, 1879.
Cook, A. B.	Louisville, 1855, 58, 59, 67.
Cook, Geo. J.	Louisville, 1873.
Cook, John B.	Henderson, 1859.
Coombs, S. W.	Bowling Green, 1875.
Coomes, M. F.	Louisville, 1880.
Cooper, M. L.	1877.
Cowan, Geo.	Danville, 1867.
Cowling, Richard O.	Louisville, 1873, 75, 78.
Craig, S. P.	Stanford, 1875.
Cummings, David,	Louisville, 1859.
Davis, E. G., (M.I.)	Underwood, 1857.
Dillard, John, (M.I.)	Lexington, 1867, 69, 72, 74, 75, 77.
Disnukes, John L.	Mayfield, 1859.
Ditzler, Robert,	Bowling Green, 1870.
Drake, Daniel,	Louisville, 1851, 52. (d. 1852.)
Drake, O. L.	Slaughtersville, 1875, 77. (d. 1879.)
*Dudley, Benjamin W., (E.P.M.)	Lexington, 1859. (d. 1870.)
Duke, A. B., (M.I.)	1867.
Duke, J. M., (M.I.)	1850.
Dunlap, Richard William,	Danville, 1869, 75.
Edwards, R. A.	Walton, 1850.
Ely, J. R., (M.I.)	1875.
Enders, F. H.	Sandwich Islands, 1880.
Evans, Asbury,	Covington, 1850. (d.)
Evans, W. R.	Harrodsburg, 1859, 67.
*Eve, Paul F.	Louisville, 1851. (d. 1877.)
Fenner, C. S.	Louisville, 1875. (d. 1879.)
Field, Samuel B., (M.I.)	Columbia, 1859.
Flemming, John T., (M.I.)	Flemmingsburg, 1857.
Flint, (M.I.)	1857.
Flint, Joshua B.	Louisville, 1850, 51 v.p., 52, 53, 55, 56, 57, 59. (d. 1864.)
Foree, E. D.	Louisville, 1859, 60.
Forester, Wm.	Louisville, 1875.
Foster, J. Q. A.	Newport, 1859.
Foster, Thos. W.	Lexington, 1876.
Freeman, D. L.	Floydsburg, 1853.
Forsyth, W. L., (M.I.)	Cynthiana, 1867.
Fuqua, Wm. M.	Hopkinsville, 1876.
Gaillard, Edward Samuel,	Louisville, 1869, 75.
Gains, R. W.	Hopkinsville, 1875.
Gaither, W. N., (M.I.)	Empire Iron Works, 1859.
Gale, R. H.	Louisville, 1873, 74, 75.
Gardner, W. H., (M.I.)	Woodsonville, 1850, 59.
Gilpin, W. E.	Louisville, 1859.
Givins, Hugh L.	Lagrange, 1859.
Goldsmith, Middleton,	Louisville, 1859.
Goodloe, A. W.	Louisville, 1858.
Gore, Joshua, (M.I.)	Bloomfield, 1859.
Greenly, T. B.	Orell, 1877, 78, 79, 80.
Griffin, Hamilton,	Louisville, 1867.
Griffiths, D. J.	Mt. Washington, 1860.

Griffiths, Thos. J.	Louisville, 1874, 75.
Griffiths, Wm. M., (M.)	Louisville, 1876.
Grimes, Lewis A.	Concord, 1875.
Gross, Samuel D.	Louisville, 1850, 54, 56.
Grubb, Thomas H.	Russellville, 1858.
Hale, Josiah,	Owensboro, 1869, 70, 73, 75.
Hanna, Wm. M.	Henderson, 1875, 76.
Hardin, John,	Louisville, 1859. (d.)
Hays, William,	Covington, 1859, 67.
Henderson, Wm. Wharton,	Covington, 1869, 76.
Hewitt, R. C.	Louisville, 1859, 75.
Hodge, J. A., (M.I.)	Henderson, 1859, 75.
Holland, J. W.	Louisville, 1872, 73.
Holloway, James Montgomery,	Louisville, 1869, 75.
Holt, Wm. D.	Covington, 1850, 59.
Hood, Thomas H.	Springfield, 1875.
Hopson, H.	Paris, 1859.
Howard, R. J.	Pryersburg, 1875.
Ireland, A. J.	Louisville, 1867.
*Jackson, John Davies,	Danville, 1867, 69, 71, 72, 73, 74, 75 v.p. (d. 1875.)
Jessop, D. H.	Covington, 67.
Johnston, D.	Westport, 1875.
Johnston, J. C.	Louisville, 1855.
Juler, H. Cundell,	Covington, 1873.
Karnes, Charles,	Covington, 1867.
Keller, D.	Paris, 1875.
Keller, J. Irwin,	Louisville, 1877, 79.
Keller, James M.	Louisville, 1870, 72, 73, 74 v.p., 75, 76.
Kelly, Clinton W.	Louisville, 1875.
Kirkpatrick, W. D.	Fredonia, 1875.
Kitchell, N. A.	Henderson, 1875.
Knapp, James,	Louisville, 1875.
Landrum, J. D.	Mayfield, 1859.
Larrabee, J. A.	Louisville, 1875, 76.
Letcher, James Hughes,	Henderson, 1875.
Letcher, J. P.	Lexington, 1876.
Letcher, R. P.	Henderson, 1859. (d. 1867.)
Lewis, John T.	Carrollton, 1867.
Logan, P. W.	Stanford, 1873.
Logan, R. F.	Shelbyville, 1875.
Long, W. H.	Louisville, 1875, 76.
Lovelace, L. M.	Milburn, 1873, 75.
Lowrey, James,	Shelbyville, 1875.
Luten, J. R.	Wesley, 1873.
McCoy, P. Y.	Columbus, 1873.
McDonald, M. G.	Louisville, 1878.
McElroy, J. F.	Lebanon, 1867.
McMurtry, L. S.	Danville, 1875.
McNary, Hugh F.	Princeton, 1875.
Magoffin, John,	Louisville, 1854.
Mann, Charles,	Nicholasville, 1873, 75, 76.
Marshall, N. B.	Louisville, 1859.
Marshall, Thomas, (M.)	Louisville, 1859.
Martin, W. A., (M.)	1873.
Martin, Wm. U.	Richmond, 1869, 75, 76.
Mattingly, C. P.	Bardstown, 1857, 58, 59.
Maxwell, D. A.	Paducah, 1875.
*Miller, Henry,	Louisville, 1850, 59 p., 60, 67. (d. 1874.)
Miller, W. H.	Henderson, 1859. (d.)
Mills, Samuel Blackburn,	Louisville, 1869.

Mitchell, Thomas D.	Lexington, 1847.
Montgomery, F. G.	Hopkinsville, 1859.
Moore, T. J.	Harrodsburg, 1853.
Nelson, Alf. B.	Danville, 1875.
Norwood, Walter A.	Henderson, 1854, 55.
Octerlony, John A.	Louisville, 1873, 74, 75, 76, 77, 80.
Oldham, W. B.	New Castle, 1876. (d. 1877.)
O'Nan, Dennis,	Christiansburg, 1875.
O'Reilly, D. J.	Louisville, 1859. (d.)
Owen, W. Talbot,	Louisville, 1875.
*Palmer, B. R., (M.)	Louisville, 1859. (d. 1866.)
Palmer, E. R.	Louisville, 1867, 73, 75.
Parsons, C. W.	Louisville, 1875.
Parvin, Theophilus,	Louisville, 1870.
Paschall, N. J.	Fulton, 1875.
Pendleton, John E.	Hartford, 1875.
Perkins, George,	Somerset, 1875.
Phister, John P., (M.I.)	Maysville, 1867.
Pleasants, J. A., (M.I.)	1850.
Polin, John H.	Springfield, 1859.
Porter, D. N.	Eminence, 1875, 76.
Porter, L. C.	Bowling Green, 1857.
Powell, Lewellin,	Louisville, 1850, 52, 59.
Poynter, M. E.	Medway, 1875.
Pretlow, Richard,	Harrodsburg, 1867, 77.
Price, A. D.	Harrodsburg, 1875, 76, 80.
Pritchett, J. W.	Madisonville, 1875.
Pusey, H. K.	Garnetsville, 1859.
Rankin, Paul, (M.I.)	1867.
Raphael, B. J.	Louisville, 1850.
Ray, L. G.	Paris, 1850, 52, 57.
Redd, R. G., (M.I.)	1875.
Reynolds, Dudley S.	Louisville, 1872, 75, 77, 79, 80.
Richardson, E., (M.I.)	Monticello, 1859, 74, 75.
Richardson, S. B.	Louisville, 1858, 59. (d.)
Richardson, T. G.	Louisville, 1855.
Risk, J. A., (M.I.)	Covington, 1880.
Rodman, W. B.	Frankfort, 1875.
Rogers, Coleman,	Louisville, 1875.
Rogers, Lewis,	Louisville, 1859, 72. (d. 1875.)
Ronald, G. W.	Louisville, 1859.
Rowland, A. O., (M.)	St. Louis, Mo., 1877.
Russell, E. P.	Elkton, 1879.
Russell, L.	Owensboro, 1859.
Sample, S., (M.)	1852.
Satterwhite, T. P.	Louisville, 1859.
Saunders, J. Bartlett, (M.)	1867.
Saunders, R., (M.)	Paducah, 1875.
Scott, J. W.	Louisville, 1854.
Seely, E. P., (M.)	1873.
Settle, Thomas L.	Louisville, 1858.
Shaler, N. B.	Newport, 1867.
Shively, A. H., (M.I.)	Campbellsville, 1859.
Shoemaker, T. J.	Morganfield, 1875.
Silliman, Benjamin, Jr.,	Louisville, 1852, 53.
Singleton, J. W.	Paducah, 1857, 59, 75, 77.
Skillman, Henry Martyn,	Lexington, 1859, 67, 69, 72, 74, 75, 76, 77.
Smith, David T., (M.)	Louisville, 1873.
Smith, Joseph,	Lexington, 1875. (d.)
Smith, Samuel L. S.	Lancaster, 1874, 75.

Smith, W. O.	Newport, 1873.
Sneed, William C.	Frankford, 1859, 60. (d.)
Spencer, B. F.	Fulton, 1875.
Spillman, C. H.	Harrodsburg, 1850, 59.
Stephens, B. L.	Union, 1850.
Stirman, W. D.	Owensboro, 1859. (d.)
Sutton, Wm. L., (E.P.M.)	Georgetown, 1850, 52, 56, 58 v.p., 59. (d.)
Taylor, H.	Winchester, 1875.
Taylor, Thomas W.	Henderson, 1875.
Temple, J. J.	Covington, 1867.
Thomas, Charles F.	Covington, 1867, 72, 77, 80.
Thomas, J. P.	Pembroke, 1875, 76.
*Thomas, Richard C.	Bowling Green, 1875. (d. 1879.)
Thompson, Joseph W.	Paducah, 1873, 75, 76, 77.
Thompson, Pinckney,	Henderson, 1875, 76, 77, 79.
Thomson, David D.	Louisville, 1855, 59, 75.
Thruston, John,	Louisville, 1872.
Todd, Charles H.	Owensboro, 1875.
Todd, L. Beecher,	Lexington, 1859, 67, 72, 75.
Todd, Orin D.	Eminence, 1872, 75.
Turner, W. A.	Mayfield, 1859.
Von Donhoff, Edward,	Louisville, 1874, 75.
Walling, Willoughby,	Louisville, 1873, 75.
Watkins, S. S.	Owensboro, 1875.
Weatherford, E. D.	Louisville, 1859.
Wetherby, S. O., (M.I.)	Middletown, 1875.
Whitner, Geo. H., (M.I.)	Centerville, 1867.
Wible, B. M.	Louisville, 1859.
Willis, S. W.	Pine Grove, 1875, 77.
Wilson, F. C.	Louisville, 1873, 75, 76.
Wise, T. N.	Covington, 1867, 71.
Wood, A. C.	Owensboro, 1860, 75.
Wood, B. S., (M.I.)	Trenton, 1857.
Woodbridge, John Elliot,	Neatsville, 1869.
Yandell, D. W.	Louisville, 1850, 52, 56, 57, 59, 67 v.p., 70, 71, 72 p., 73, 75, 77.
*Yandell, L. P.	Louisville, 1848, 53, 59, 75. (d. 1878.)
Yandell, Lunsford Pitt, Jr.,	Louisville, 1869, 73, 75, 76, 77.

LOUISIANA.

Adler, Emanuel, (M.I.)	New Orleans, 1869.
Anfaux, Octavus,	New Orleans, 1869, 70.
Austin, Wm. Glover, (M.I.)	New Orleans, 1869.
Avery, Geo. Whitfield, (M.I.)	New Orleans, 1869.
Barton, Edw. H.	New Orleans, 1848. (d. 1859.)
Beard, Cornelius,	New Orleans, 1857, 69.
Bemiss, Samuel Merrifield,	New Orleans, 1869 v.p., 70, 79.
Bensaden, J., (M.I.)	New Orleans, 1869.
Boyer, Pierre Caverly,	New Orleans, 1869.
Brickham, Chas. Casper, (M.I.)	New Orleans, 1869.
Brown, Alexander Porter,	Clinton, 1869.
Buffington, Thos. Jefferson,	Baton Rouge, 1869.
Burns, James, (M.)	New Orleans, 1869.
Carpenter, Wm. M.	New Orleans, 1847.
Carter, John, (M.I.)	New Orleans, 1869.
Chaillé, Stanford Emerson, (E.P.M.)	New Orleans, 1869, 78, 79.
Choppin, Samuel, (M.I.)	New Orleans, 1869.
Cullan, John Merrill, (M.I.)	New Orleans, 1869.

Dennis, F. H., (M.I.)	New Orleans, 1869, 70.
DeRoalds, A. W.	New Orleans, 1879.
Douglas, J. Hancock, (M.I.)	1853.
Dowler, Bennet, (M.)	New Orleans, 1850. (d.)
Drew, E. S.	New Orleans, 1870.
Dupree, J. W.	Baton Rouge, 1877.
Dyer, John Good, (M.I.)	New Orleans, 1869.
Egan, James C.	Shreveport, 1877.
*Fenner, Erasmus Darwin,	New Orleans, 1851, 54 v.p., 57. (d. 1866.)
Fish, Jas. S.	Alexandria, 1880.
Fisher, John Adams Gideon,	New Orleans, 1869.
Flint, Austin,	New Orleans, 1860.
Flint, Austin, Jr.,	New Orleans, 1860.
Harper, Miles Hampton, (M.I.)	Harrisonburg, 1869.
*Harrison, John Hoffman,	New Orleans, 1847 v.p. (d. 1849.)
Hays, George A. B.	Happy Jack, 1877.
Henry, Stewart L., (M.I.)	New Orleans, 1869, 78, 79.
Herrick, Stephen Solon,	New Orleans, 1869.
Hurd, Seth Richardson, (M.I.)	New Orleans, 1869.
*Jones, James,	New Orleans, 1849, 51. (d. 1873.)
Jones, Joseph,	New Orleans, 1869.
Kelly, Charles Hurst.	New Orleans, 1869.
Langworthy, Owen Palmer,	Clinton, 1869, 78.
Legare, John Cecil, (M.I.)	New Orleans, 1869.
Lewis, Earnest S.	New Orleans, 1878, 79.
Lewis, Geo. Williams, (M.I.)	New Orleans, 1869.
Logan, Samuel,	New Orleans, 1869, 70.
Lyons, J. J.	Orleans Parish, 1879.
McKelvey, Peter Beckman, (M.I.)	New Orleans, 1869.
McMillen, Wm. P., (M.I.)	Trinity, 1869.
Mitchell, William Stanton,	New Orleans, 1869.
Morris, James Eppis, (M.I.)	New Iberia, 1869.
Moss, Benjamin Hart,	New Orleans, 1869. (d. 1873.)
New, Robert A.	Mansfield, 1857, 59.
Nott, G. A.	New Orleans, 1852. (d. 1867.)
Pope, B. A.	New Orleans, 1879.
Richardson, Tobias Gibson,	New Orleans, 1869, 77, 78 P., 79, 80.
Schuppert, Moritz, (M.I.)	New Orleans, 1869.
Scruggs, S. O.	Clantonville, 1857, 59.
Shepherd, Edward Taylor, (M.I.)	New Orleans, 1869.
Simonds, Joseph C.	New Orleans, 1849.
Smith, Howard,	New Orleans, 1869.
Smythe, Andrew Woods,	New Orleans, 1869.
Stille, Benjamin, (M.I.)	New Orleans, 1869.
*Stone, Warren S.	New Orleans, 1869 v.p. (d. 1872.)
Swartzwelder, A. C.	New Orleans, 1869.
Tibault, Christopher H., (M.I.)	New Orleans, 1869.
Tiruit, Pierre Clement, (M.I.)	Cantrille, 1869.
Turpin, Charles,	New Orleans, 1869.
Watrous, Wm. Hamilton, (M.I.)	New Orleans.
Wedderburn, A. J.	New Orleans, 1847. (d.)
Wilson, Wm. C., (M.I.)	New Orleans, 1869.

MAINE.

Allen, John L., (E.P.M.)	Saco, 1865.
Allen, Wm. H.	Arono, 1856, 60. (d. 1864.)
Babb, L. P.	Eastport, 1865.
Banks, Wm. A., (M.I.)	Rockland, 1870.

Barker, John, (M.I.)	Wilton, 1849.
Bartlett, Ezra,	South Berwick, 1853.
Benson, John, (M.)	Newport, 1853.
Boutelle, N. R.	Waterville, 1856.
*Bradbury, James C.	Old Town, 1860. (d. 1865.)
Burbank, Alexander,	Lewiston, 1865.
Buxton, Benjamin F.	Warren, 1865. (d.)
Chadwick, George H.	Portland, 1860, 64, 65.
Chase, Sumner B.	Portland, 1854.
Cobb, Wm. B.	Standish, 1876, 77.
Conant, David S.	Brunswick, 1864.
Dana, Israel T.	Portland, 1865.
Dickinson, J. P.	Bangor, 1855. (d. 1857.)
Dunn, B. F.	1876.
Eastbrook, Joseph H.	Camden, 1854, 65.
Eastbrook, Thomas L.	Rockland, 1865, 79, 80.
Emerson, Nathan,	Orland, 1855. (d.)
Everleth, F. M.	Waldoboro, 1876.
Faybian, George, (M.I.)	Portland, 1849.
Ferguson, Geo. B., (M.I.)	Deer Island, 1880.
Ferguson, H. B.	Deer Island, 1880.
Fessenden, C. S. D.	Portland, 1853.
Fitch, Simon, (M.I.)	Portland, 1868, 70, 72.
Ford, Corydon L.	Brunswick, 1866.
Foster, Thomas A., (M.)	1865.
Frye, Thomas,	Rockland, 1858, 60, 65. (d. 1874.)
Fuller, A. J.	Bath, 1855, 56, 78, 79 V.P., 80.
Garcelon, Alonzo,	Lewiston, 1853, 60, 65, 73, 74, 75, 76, 79.
Gaubert, A. Lewis,	Mechanics' Falls, 1880.
Goodale, Geo. L.	Portland, 1865.
Gordon, Seth C	Portland, 1872, 76.
Harris, Nathan C.	Auburn, 1860, 65. (d. 1875.)
Haskill, P. S.	Stockton, 1876.
Hersey, A. L.	Oxford, 1865.
Herson, N. A.	Portland, 1880.
Hill, E. H.	Lewiston, 1876, 80.
Hill, Hiram H.	Augusta, 1860.
Hitchcock, F. E.	Rockland, 1880.
Holmes, Job,	Calis, 1858. (d.)
Horr, O. A.	Lewiston, 1876.
Hunkins, Seth C.	Portland, 1860. (d. 1867.)
Hunt, Charles O.	Portland, 1876.
Hutchinson, Charles,	Portland, 1864, 65, 76.
Jewett, Theo. H.	South Berwick, 1865. (d. 1878.)
Keen, A. T.	Gorham, 1876.
Kimball, Irving E.	Wiscassel, 1880.
Laughton, S.	Bangor, 1876, 80.
Lawson, D. L.	Fryburg, 1876.
LeProhon, E. P.	Portland, 1865
Libby, Abiel,	Richland, 1860.
Lincoln, Isaac,	Brunswick, 1849, 52, 53, 60. (d. 1868.)
Lincoln, John D.	Brunswick, 1865. (d. 1877.)
McAllister, Asa,	Ellsworth, 1856. (d. 1864.)
McKean, James,	Topsham, 1852, 53, 58. (d. 1873.)
McRuer, Daniel,	Bangor, 1849, 53, 65, 66. (d. 1873.)
Monroe, Hollis,	Belfast, 1856, 60. (d. 1862.)
Monroe, Nahum P.	Belfast, 1855, 60, 65, 66, 68 V.P. (d. 1875.)
Mullett, Charles,	Lewiston, 1854. (d.)
Nourse, Amos,	Bath, 1860. (d. 1877.)

Oakes, Sylvester,	Auburn, 1854, 76.
Oakes, Wallace K.	Auburn, 1880.
Packard, Charles A.	Bath, 1880.
Page, Alpheus F.	Buckport, 1855, 65, 76, 80.
Page, Horatio N.	Penobscot. 1855.
Paine, Rotheus E.	Camden, 1876, 80.
Palmer, A. B.	Brunswick, 1872.
Palmer, Gideon S.	Gardner, 1855, 56, 60, 70.
Peables, Andrew M.	Auburn, 1880.
Peaslee, Edmund R.	Brunswick, 1849, 53, 55. (d. 1878.)
Perkins, Lafayette, (M.I.)	Farmington, 1849.
Rust, Wm. A.	Portland, 1865.
Sanger, E. F.	Bangor, 1876, 80.
Seavey, Calvin,	Bangor, 1865, 72.
Shannon, N.	Cape Elizabeth, 1876.
Sleeper, Frank E.	Sabattus, 1876.
Small, J. M.	Lewiston, 1880.
Smith, Dryden, (E.P.M.)	Bridgeport, 1865. (d. 1868.)
Snow, Albion P.	Winthrop, 1876.
Stockbridge, T. Gilman,	Bath, 1853, 66. (d. 1871.)
Sturgis, B. F.	Auburn, 1880.
Swan, Charles E.	Calis, 1856.
Tewksbury, Samuel H.	Portland, 1860, 64, 65.
Walker, J. B.	Union, 1865.
Weeks, Stephen H.	Portland. 1872, 75, 76, 78.
Weston, Edward B.	Bangor, 1877.
Weston, James C.	Bangor, 1855, 64, 66, 68. (d. 1877.)
Wiggins, Henry L. K.	Auburn, 1865. (d. 1875.)

MARYLAND.

Addison, John,	Baltimore, 1848. (d. 1859.)
Albers, Henry,	Baltimore, 1866.
Alexander, A.	Baltimore, 1848. (d.)
Armitage, James,	Baltimore, 1848, 66.
Arnold, Abram B.	Baltimore, 1868, 72.
Ashby, Thomas A.	Baltimore, 1880.
Atkinson, J. E.	Baltimore, 1876.
Atkinson, T. C.	Baltimore, 1848. (d.)
Baer, M. S.	Baltimore, 1848. (d.)
Bailhache, P. H.	Baltimore, 1879.
Baker, Alfred,	Baltimore, 1848. (d.)
Baldwin, E. C.	Baltimore, 1849, 64.
Baltzell, William H.	Baltimore, 1855, 66, 70. (d. 1873.)
Bates, J. W. P.	Baltimore, 1865, 66, 68.
*Baxley, H. Willis,	Baltimore, 1846, 48, 66. (d. 1876.)
Bayley, A. H.	Cambridge, 1848.
Beatty, Geo. D.	Baltimore, 1868.
Belt, Walter F.	Prince George Co., 1855.
Billingslea, J. B.	Baltimore, 1848.
Bliss, Zenas E.	Baltimore, 1866.
Bogue, Robert G.	Baltimore, 1870.
Bond, Thomas E., Jr.	Baltimore, 1848, 49, 51, 53, 58, 64, 66. (d. 1872.)
*Bordley, James,	Baltimore, 1847, 48, 49, 55, 58. (d. 1870.)
Boyd, C.	Frederick, 1850.
Briscoe, John Hanson,	Baltimore, 1847, 48, 55. (d.)
Brown, B. B.	Baltimore, 1880.
Buffington, J. U., (M.)	1870.

Buckler, Thomas H.	Baltimore, 1848.
Caldwell, J. J.	Baltimore, 1876, 78, 80.
Cathell, D. W., (M.)	Baltimore, 1872.
Chamberlain, Jos. E. M.	Easton, 1855, 80.
Chancellor, C. W.	Baltimore, 1870, 72.
Chaplain, Joseph L., (M.I.)	1866.
Chatard, Fred. E., Jr.,	Baltimore, 1868.
*Chew, Samuel,	Baltimore, 1847, 48. (d. 1863.)
Chew, Samuel C.	Baltimore, 1880.
Chisholm, Julian J., (M.)	Baltimore, 1870, 80.
Clarke, S. R.	Baltimore, 1848. (d. 1878.)
Clendenen, Wm. H.	Baltimore, 1866.
Cleveland, J. A., (M.)	Baltimore, 1851.
Cockey, Joseph C.	Baltimore, 1866.
*Cockrill, James J.	Baltimore, 1866, 67, 68, 70. (d. 1878.)
Cohen, J. I.	Baltimore, 1849. (d.)
Coleman, Jas. S.	Baltimore, 1858.
Cook, Theodore,	Baltimore, 1880.
Correll, John W.	Baltimore, 1878, 80.
Cox, Christopher C.	Baltimore, 1848, 52, 53 V.P., 55, 58, 60, 63, 64, 66, 67, 68, 70.
Crane, William B.	Baltimore, 1856.
Cronise, J. Stoll,	Frederick Co., 1848.
Currey, Jas. H.	Baltimore, 1866.
Dallam, W. M.	Hartford Co., 1848.
Davis, Wm. H.	Baltimore, 1848, 49, 55.
Dawson, James,	St. Michaels, 1852, 58.
Dear, Henry, (M.I.)	1858.
Dickson, I. N.	Pricestown, 1870.
Dickson, John,	Baltimore, 1866.
Diffendoffer, M.	Baltimore, 1848. (d.)
Dodge, A. W.	Baltimore, 1872.
Donaldson, Frank,	Baltimore, 1848, 53, 55, 66, 67, 72.
Dorsey, Lloyd,	Frederick, 1848.
*Dougherty, B. A.	Cumberland, 1872, 73. (d. 1875.)
Doyle, J. A.	Baltimore, 1866.
Du Hamel, W. J. C.	Baltimore, 1870, 72.
*Dulin, A. F.	Baltimore, 1848. (d. 1874.)
Dunbar, John R. W.	Baltimore, 1847, 48, 52, 53, 58, 66, 68, 70. (d. 1871.)
Duval, E. P.	Baltimore, 1853.
Duvall, Washington,	Montgomery Co., 1848, 53, 55. (d.)
Eastman, Lewis M., (M.I.)	Baltimore, 1866, 67, 68, 77, 78, 80.
Ellis, Charles M.	Elkton, 1866.
Erich, Aug. F.,	Baltimore, 1880.
Evans, John,	Havre De Grace, 1866. (d.)
Evans, Thomas B.	Baltimore, 1872, 74, 76, 78, 79, 80.
Evans, Wm. J., (M.)	1868.
Fay, George W.	Baltimore, 1869.
Field, Philip S.	Baltimore, 1858.
Finney, John M.	Chinchardie, 1868.
*Fonerden, John,	Baltimore, 1848, 66. (d. 1869.)
Forwood, W. Stump, (M.I.)	Darlington, 1866, 67, 68, 76.
Frank, S. L.	Baltimore, 1872.
*Frick, Charles,	Baltimore, 1855. (d. 1860.)
Friedenwall, A.	Baltimore, 1870, 72.
Garretson, F.	Baltimore, 1868, 70.
Germon, Frank W.	Baltimore, 1872.
Gerstell, A. F.	1870.
Gibson, Charles Bell,	Baltimore, 1846, 47. (d. 1865.)
*Gibson, George S.	Baltimore, 1852. (d. 1872.)

Gibson, J. Grigg,	Fredericktown, 1849.
Gilman, Judson,	Baltimore, 1855, 58, 60, 66, 68, 70, 80.
Gitting, David S.	Baltimore, 1848.
Gleitsman, W.	Baltimore, 1879.
Goldsborough, Henry T.	Easton, 1853.
Green, Wm.	Baltimore, 1880.
Grieves, H. G.	Cambridge, 1858. (d.)
Grimes, J. H.	Baltimore, 1870.
Gun, John P.	Baltimore, 1848. (d.)
Hamsley, W.	Carolina Co., 1848. (d.)
*Handy, Samuel K.	Somerset, 1848, 55, 58. (d. 1859.)
Handy, W. W.	Baltimore, 1848. (d. 1853.)
Hardcastle, Edw. M.	Trappe, 1853, 55.
Harris, C. A.	Baltimore, 1848. (d.)
Harry, Samuel M.	Bayview, 1866. (d. 1868.)
Hartman, Andrew,	Baltimore, 1866, 67, 68, 70.
Hartman, J. H.	Baltimore, 1878, 80.
Hebb, T. W.	Mount Olive, 1858.
Hinkle, E. J., (M.)	Baltimore, 1872.
Helsby, Thomas H.	Cumberland, 1866, 68, 70.
*Hintze, F. E. B.	Baltimore, 1848, 49, 50, 51, 53, 55, 58, 64 V.P., 65. (d. 1865.)
Hopkins, Joel,	Elkridge Landing, 1847, 48, 53, 55, 58, 66. (d. 1868.)
Hopkins, Thomas C.	Havre De Grace, 1867, 68.
Hopkins, W. W.	Havre De Grace, 1876.
Horsey, J. B., (M.)	1848.
Houck, J. W.	Baltimore, 1858.
Howard, E. Lloyd,	Baltimore, 1868, 70, 72, 73, 74, 75, 76, 79, 80.
Howard, Wm. T.	Baltimore, 1872.
Hudgin, Wescom, (M.)	Baltimore, 1868.
*Inloes, Henry A.	Baltimore, 1858, 66, 67, 68. (1874.)
Jamar, John H.	Elkton, 1880.
Jamason, H. G., Sr.	Baltimore, 1848. (d.)
Jenkins, Solomon,	Easton, 1847. (d. 1849.)
Johnson, R. P., (M.)	Frederick, 1850.
Johnston, Christopher,	Baltimore, 1855, 66, 68, 70.
Johnston, Samuel,	Baltimore, 1878, 80.
Jones, Charles H.	Baltimore, 1866, 68, 70.
Kemp, Wm. M.	Baltimore, 1858, 66.
Kennard, Thomas C.	Harmony, 1855.
Kennedy, S. D.	Baltimore, 1858.
Kenney, W., Jr.	Baltimore, 1848.
*Kinnemon, Perry S.	Baltimore, 1853, 65, 66, 67, 68, 70. (d. 1877.)
Kluber, Charles J.	Baltimore, 1872. (d. 1877.)
Lancaster, F. M., (M.I.)	Harris Lot, 1870.
Latimer, Thomas S.	Baltimore, 1870, 76.
Lawrence, George W.	Catonsville, 1855, 58, 59.
Leonard, W. T.	Baltimore, 1847, 48. (d.)
Logan, Joseph P.	Baltimore, 1868.
Lynch, John S.	Baltimore, 1876, 79, 80.
McElderry, Henry,	Baltimore, 1866.
McGill, Charles,	Hagerstown, 1855, 58.
McGill, George M.	Baltimore, 1866. (d.)
*Mackenzie, John P.	Baltimore, 1848. (d. 1864.)
McKew, Dennis I.	Baltimore, 1858, 66, 68, 70, 77.
McSherry, Richard, (M.)	Baltimore, 1866, 76, 80.
Maddox, T. Clay,	Baltimore, 1870, 77, 78, 79, 80.
Mahon, Ormsby S.	Baltimore, 1864, 65, 66, 68, 72.

Martin, Thomas W.	Dorchester Co., 1848, 55.
Matthews, Thomas,	Milestown, 1855.
Medcalfe, W. H.	Baltimore, 1848.
Miles, F. T.	Baltimore, 1870.
Miltenberger, Geo. W.	Baltimore, 1848, 51, 52, 53, 55, 58.
*Monkur, John C. S.	Baltimore, 1848, 66. (d. 1867.)
Monmonier, John F.,	Baltimore, 1855, 58, 68, 70.
Moorman, J. J.	Baltimore, 1868.
*Morgan, Gerard E.	Baltimore, 1858, 64, 65, 66. 68. (d. 1874.)
Morris, John,	Baltimore, 1868, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79 v.p., 80.
Muller, John R.	Baltimore, 1866. (d. 1868.)
Murdock, Thomas F.	Baltimore, 1866.
Murray, T. Morris,	Baltimore, 1876.
Muse, James A.	Cambridge, 1858.
Neff, John,	Baltimore, 1866.
Noel, H. R.	Baltimore, 1868, 70. (d. 1878.)
*O'Donnell, D. A.	Baltimore, 1853, 55, 68, 70, 71, 72, 73. (d. 1874.)
Ohr, Charles H.	Cumberland, 1868, 70, 72, 76, 77.
Owings, John H.	Roxbury, 1848, 66. (d.)
Owings, S. K.	Baltimore, 1848. (d.)
Parmley, Eliazer,	Baltimore, 1849.
Piggott, A. Snowden,	Baltimore, 1855. (d. 1868.)
*Pinkney, Ninian,	Easton, 1875, 76 v.p., 77. (d. 1877.)
Porter, G. Ellis,	Lonaconing, 1868, 70.
Porter, Jas. M.	Frostburg, 1872.
Powell, Samuel F.	Baltimore, 1866, 67, 68, 70, 72.
Power, William,	Baltimore, 1847, 48. (d.)
Preston, Jacob A.	Harford Co., 1848.
Reed, James A.	Baltimore, 1866.
Reed, John A. (M.I.)	1866.
Regester, W. G.	Baltimore, 1870, 80.
Rennolds, H. T.	Baltimore, 1875, 76.
Rich, Arthur,	Baltimore, 1870.
Riley, William,	Baltimore, 1853, 55, 66.
*Roberts, Geo. C. M.	Baltimore, 1847, 48, 49, 50, 52, 58. (d.)
Roberts, Thomas A.	Cecilton, 1866.
Robinson, Alexander C.	Baltimore, 1847, 52. (d.)
Roby, Joseph,	Baltimore, 1849, 53. (d. 1860.)
Rodriques, B. A., (M)	Baltimore, 1851.
Sappington, John K.	Havre De Grace, 1855. (d.)
Sappington, T.	Liberty, 1848.
Scott, Martin P.	Hooversville, 1868, 70.
Silliman, W. A. B.	Baltimore, 1880.
Silver, Silas B.	Glenville, 1867, 68, 72, 76.
Sim, J. Thomas,	Liberty, 1866.
Sim, Thomas,	Frederick, 1848.
Smith, J. T.	Baltimore, 1880.
*Smith, Nathan R.	Baltimore, 1847, 48, 49, 68, 70. (d. 1877.)
Smith, Samuel P.	Cumberland, 1849, 50, 52, 55, 58, 66, 68, 70, 72, 73, 76, 77.
Snodgrass, Joseph E., (M.)	Baltimore, 1853. (d.)
Steiner, Lewis H.	Frederick, 1852, 58, 60.
Stevenson, John M.	Baltimore, 1872. (d. 1878.)
Stevenson, J. S.	Baltimore, 1850.
Stewart, James A.	Baltimore, 1868, 72, 73, 76, 77.
*Stuart, R. S.	Baltimore, 1848, 49. (d. 1876.)
Stirling, R. H.	Baltimore, 1870.
Stokes, W. H.	Baltimore, 1848, 58, 60.
Stump, William H., (M.I.)	1866.

Tanneyhill, G. Lane,	Baltimore, 1866, 70, 72.
Teackle, John N.	Baltimore, 1848. (d.)
Theobold, Elisha W.	Baltimore, 1848, 50. (d.)
Thomas, Jas. Cary,	1880.
*Thomas, Richard H.	Baltimore, 1848, 52, 55. (d)
Tilghman, F.	Hagerstown, 1848.
Titcomb, B.	Baltimore, 1868, 70.
*Tyler, Samuel,	Frederick, 1847, 48, 53. (d. 1856.)
Uhler, John R.	Baltimore, 1866, 70, 80.
Van Bibber, W. C.	Baltimore, 1865, 66, 68, 72, 78.
Walsh, D. M.	Baltimore, 1872.
Ward, J. Robert,	Baltimore, 1860, 70.
Warfield, Jesse L.	Westminster, 1848.
Warren, Edward,	Baltimore, 1860, 66, 68, 70, 72.
Wayson, George W.	Baltimore, 1866, 70.
Webster, John Lee,	Baltimore, 1848. (d.)
Westcott, A.	Baltimore, 1848.
White, A. A.	Baltimore, 1866.
White, A. M.	Easton, 1855.
White, Joseph A.	Baltimore, 1879.
White, S. N. C.	Poolsville, 1858. (d.)
Whitridge, John,	Baltimore, 1866. (d. 1878.)
Whitridge, W., (M.I.)	Baltimore, 1866, 67.
Willard, A. P., (M.I.)	1850.
Williams, J. W., (M.)	1866.
Williams, Philip C.	Baltimore, 1867, 70, 72.
Williams, W.	Somerset, 1848.
Wilson, Henry M.	Baltimore, 1866, 67, 70.
Wilson, H. P. C.	Baltimore, 1858.
Winne, James,	Baltimore, 1849, 53.
Winslow, Randolph,	1880.
Womble, Pembroke M.	Baltimore, 1858, 66.
Wroth, Peregrine,	Chestertown, 1847, 48, 49, 55, 56, 58. (d. 1879.)
Yates, John L.	Baltimore, 1848. (d. 1875.)

MASSACHUSETTS.

Abbe, Alanson,	Boston, 1860. (d. 1864.)
Abbe, E. P.	New Bedford, 1863, 67.
Abbott, Samuel L.	Boston, 1849, 65.
Adams, B. F. D.	Waltham, 1876.
Adams, H. O.	South Royalston, 1872.
Adams, Horace W.	Boston, 1856. (d. 1861.)
Adams, Horatio,	Waltham, 1849, 51. (d. 1861.)
Adams, J. F. A.	Pittsfield, 1872.
Adams, Nathan,	Springfield, 1853.
Adams, Z. Boylston,	Boston, 1847, 48, 49, 50, 51, 52, 53. (d. 1855.)
Adams, Z. B.	Framingham, 1880.
Agassiz, Lewis, (E.P.M.)	Cambridge, 1849. (d. 1873.)
Ainsworth, F. S.	Boston, 1849. (d. 1878.)
Alden, Ebenezer,	Randolph, 1849, 53, 58, 65.
Allen, Nathan,	Lowell, 1849, 53, 65, 70, 75.
Alley, John B.	Boston, 1852, 53. (d. 1862.)
Ames, Azel,	Wakefield, 1879.
Ames, J. S.	Holden, 1865.
Amory, Robert,	Brookline, 1870, 72.
Andrews, Robert,	Orange, 1866. (d. 1869.)
Andrews, Robert F.	Gardner, 1872, 78.

Appleton, John,	Cambridge, 1867. (d. 1869.)
Atwood, George,	Fair Haven, 1860, 64, 65, 67.
Ayer, James,	Boston, 1858, 65.
Babbitt, Nathan S.	North Adams, 1864.
Bacon, John, Jr.	Boston, 1849, 65.
Bancroft, Amos B.	Charlestown, 1849, 65. (d. 1879.)
Barrett, W. M.,	Boston, 1880.
Bartlett, George,	Boston, 1849, 53. (d. 1864.)
Bartlett, Henry, (M.)	Boston, 1849. (d. 1872.)
*Bartlett, John C.	Dedham, 1849, 65. (d. 1878.)
Bartlett, Josiah,	Concord, 1848, 49. (d. 1878.)
*Bartlett, Lyman,	New Bedford, 1849, 52, 53, 60, 63. (d. 1865.)
Barton, Edward,	South Orange, 1858, 60, 63, 65.
Bass, Wm.	Lowell, 1878.
Batcheller, Stephen,	Royalston, 1848. (d. 1848.)
Bates, Joseph N.	Worcester, 1854, 64.
Bell, Artemus,	Feeding Hills, 1860. (d. 1877.)
Bell, Cyrus,	Feeding Hills, 1860.
*Bell, Luther V.	Charlestown, 1849. (d. 1862.)
Bemis, C. V., (E.P.M.)	Medford, 1865.
Bemis, David,	Chickopee, 1849, 51. (d. 1852.)
Bemis, Jonathan W.	Charlestown, 1849, 53, 55, 58, 65.
Bethune, George A.	Boston, 1849, 65.
Bielby, Porteus P.	Salem, 1878.
Bigelow, George F.	Boston, 1850, 58, 65, 66, 68.
*Bigelow, Henry,	Newton, 1865. (d. 1865.)
Bigelow, Henry J.	Boston, 1849, 53, 65.
Bigelow, Jacob,	Boston, 1849, 52, 65. (d. 1879.)
Bixby, Geo. Holmes,	Boston, 1875, 76, 80.
Blake, E. Whitney,	Boston, 1849, 60. (d. 1873.)
Blake, Jeremiah, (M.)	Lowell, 1852.
Blake, John Ellis,	Boston, 1855.
Blake, John G.	Boston, 1865.
Blodgett, Albert N.	Boston, 1878.
Blodgett, Julius, (M.)	West Brookfield, 1860.
Bouney, Franklin,	Hadley, 1860.
Borland, J. Nelson,	Boston, 1853, 55, 60, 65.
Boutelle, Thomas R.	Fitchburg, 1853, 65. (d. 1869.)
Bowditch, Henry I.	Boston, 1848, 49, 50. 53, 58, 65, 67 V.P., 70, 72, 75, 76 P., 77 P., 80.
Bowen, E.	Barnstable, 1858.
Breck, Thomas F.	Springfield, 1880.
Breck, Wm. G.	Springfield, 1878.
Brewster, J. B.	Plymouth, 1880.
Bridgman, Wm.	Springfield, 1847. (d. 1864.)
Briggs, John,	Boston, 1865.
Bronson, John R.	Attleboro, 1864, 65, 66, 67, 72, 73, 75, 76, 78, 80.
Brooks, L. S.	Springfield, 1880.
Brown, Abner H., (M.)	Lowell, 1849. (d. 1851.)
Brown, Buckminster,	Boston, 1849, 65.
Brown, Charles H., (M.)	Boston, 1853.
Brown, Francis H.	Boston, 1865.
Brown, Jonathan,	Tewksbury, 1849, 53, 60. (d. 1867.)
Brown, Orlando,	Wrentham, 1860.
Brown, Charles D. H., (M.)	1849.
*Buck, Ephraim,	Boston, 1849, 53, 55. (d. 1859.)
*Buckingham, Charles E.	Boston, 1849, 65. (d. 1877.)
Burgiss, E. P.	Dedham, 1865. (d. 1877.)

Burnap, Sewell G.	Holliston, 1853, 55, 58, 60, 64, 65, 70. (d. 1874.)
Burnham, Walter,	Lowell, 1867.
Cabot, Samuel, Jr.,	Boston, 1849, 65.
Cady, Franklin A., (M.)	Pittsfield, 1849. (d. 1875.)
Calkins, Marshall,	Springfield, 1866, 68.
Campbell, Robert, (M.I.)	Pittsfield, 1849.
Carleton, Charles G.	Lawrence, 1876, 80.
Carpenter, E. W.	Chatham, 1853.
Carpenter, Henry,	Warren, 1858, 60.
Carpenter, Nelson,	Warren, 1856, 65. (d. 1872.)
Chace, John B.	Taunton, 1865.
Chadwick, James R.	Boston, 1875, 76, 80.
Chaffee, C. C., (M.I.)	Springfield, 1858.
Chamberlain, Cyrus N.	Lawrence, 1858, 60, 65, 76, 80.
Chamberlain, M. L.	Boston, 1880.
Channing, Walter,	Boston, 1849. (d. 1876.)
Channing, Walter,	Brookline, 1880.
Chapin, Alonzo,	Winchester, 1860, 65. (d. 1876.)
Chapman, Thomas L.	Long Meadow, 1853, 60.
Chase, Charles,	Deerfield, 1849. (d. 1864.)
Chattuck, Geo. C., (M.)	1849.
Cheever, David W.	Boston, 1865.
Childs, Henry H.	Pittsfield, 1849, 56, 60, 64, 65. (d. 1868.)
*Childs, Timothy, (E.P.M.)	Pittsfield, 1860, 64. (d. 1865.)
Choat, George,	Salem, 1853, 55, 58.
Church, Jefferson, (E.P.M.)	Springfield, 1865.
Clark, Alonzo,	Pittsfield, 1846.
Clark, A. P.	Cambridge, 1880.
*Clark, Edward H.	Boston, 1849, 55, 75. (d. 1877.)
Clark, Henry G.	Boston, 1849, 53, 58, 60, 64, 65.
Clark, Rowse R.	Whitinsville, 1860
Clarke, Alpheus B.	Holyoke, 1860. (d. 1869.)
*Clarke, Henry,	Worcester, 1860. (d. 1880.)
Clarke, Moses,	East Cambridge, 1853, 58. (d. 1864.)
Cleveland, C. D., (E.P.M.)	Boston, 1865. (d. 1875.)
*Coale, William E.	Boston, 1849. (d. 1865.)
Coburn, G. A., (M.I.)	Cambridge, 1880.
Coggswell, E., (M.I.)	Cambridge, 1880.
Cogswell, Edward R.	Cambridge, 1876.
Cogswell, George,	Bradford, 1849.
Coit, Daniel T.	Boston, 1853, 58, 64, 65.
Collins, Clarkson T.	Great Barrington, 1853, 60, 65, 70, 72, 76, 78, 80.
Colony, George D.	Fitchburg, 1864, 65, 68.
Comstock, William W.	Middleborough, 1849, 56, 65. (d. 1878.)
Coolidge, Jas.	Athol, 1865. (d. 1869.)
Cornell, Wm. M.	Boston, 1855, 72.
Cornish, Aaron,	New Bedford, 1849. (d. 1864.)
Cotting, Benjamin E.	Roxbury, 1849, 55, 58, 63.
Cowles, Henry, (E.P.M.)	Saxonville, 1860, 65.
Cox, Benjamin, Jr.,	Salem, 1855, 58, 65. (d. 1871.)
Crane, Phineas,	East Boston, 1849.
Cross, Enoch,	Newburyport, 1860, 65.
Crozier, Thos.	Charlestown, 1880.
Cummings, Wm. H., (M.I.)	Williamstown, 1858.
Curtis, Hall,	Boston, 1865.
Curtis, Josiah,	Boston, 1847, 48, 49, 60.
Cutler, E. G.	Boston, 1876.
Cutler, Nehemiah,	Pepperell, 1847, 49. (d. 1859.)

Cutter, Benjamin,	Woburn, 1849, 50, 55, 58, 63. (d. 1864.)
Cutter, Ephraim,	Boston, 1871, 72, 73, 76, 77, 78, 80.
Dale, William J.	Andover, 1849, 60.
*Dalton, John C.	Lowell, 1848, 50, 55, 58, 63. (d. 1864.)
Damon, Howard F.	Boston, 1864, 65, 80.
Dana, David,	Lawrence, 1865.
Davis, Charles A.	Chelsea, 1853, 58. (d. 1863.)
Davis, Robert T.	Fall River, 1855. (d.)
Davis, R. T.	Fall River, 1876.
Day, Albert,	Boston, 1876.
Deane, A. C.	Greenfield, 1870.
Dearborn, R. F.	Lynn, 1880.
Dearborne, A. D.	Newton, 1849. (d. 1871.)
Denniston, E. E.	North Hampton, 1858.
Derby, George, (M.)	Boston, 1849. (d. 1874.)
Derby, Hasket,	Boston, 1864.
Dickenson, Wm., (M.)	1853.
Dickerman, Lemuel, (M.)	Foxboro, 1853.
Dickey, Hanover,	Lowell, 1849, 53. (d. 1873.)
Dix, John H.	Boston, 1849, 64, 65.
Dorr, James Colby,	Medford, 1868, 70.
Doggett, Perez F.	Wareham, 1864. (d. 1875.)
Downes, Nathaniel,	Quincy, 1868.
Drew, S. Watterson,	Woburn, 1865. (d. 1875.)
Drown, Henry W.	Richmond, 1865. (d. 1875.)
Duncan, Charles M.	Shelburne.
Dunlap, James,	Northampton, 1858, 63, 65.
Dwelly, J.	Fall River, 1880.
Dyer, Henry, (M.)	1849.
Dyer, J. Franklin,	Gloucester, 1865. (d. 1879.)
Eames, Ambrose,	Wrentham, 1855.
Eastman, Edmund T.	Boston, 1855, 56, 65.
Edes, R. T.	Boston, 1880.
Edwards, Nathaniel B.	North Chelmsford, 1858, 65.
Ellis, Calvin,	Boston, 1853, 55, 65.
Fabyan, George,	Boston, 1860, 64, 65. (d. 1874.)
Fairbanks, Jas. R.	Ashfield, 1872, 80.
Farnum, Joseph,	Salem, 1853, 55. (d. 1874.)
Fay, Allen C.	Milford, 1855, 58, 64, 65.
Fay, Charles M.	Charlton, 1855. (d. 1868.)
Fay, J. Allen,	Milford, 1868.
Fearing, Elisha P.	Nantucket, 1849, 52. (d. 1876.)
Ferre, Henry,	Dalton, 1860.
Field, C. C.	Loinnister, 1864, 68.
Field, Henry M.	Newton, 1870.
Fisher, Theodore W.	Boston, 18.6, 80.
Fiske, Calvin P.	Willsdale, 1853, 55. (d. 1874.)
Fiske, Daniel Shaw,	East Brookfield, 1864. (d. 1878.)
Fiske, Samuel A.	Northampton, 1853.
Flint, Edward,	Leicester, 1848, 49, 53.
Flint, John,	Boston, 1849, 54, 65. (d. 1875.)
Flint, John S.	Roxbury, 1865.
Fogg, David S.	Dedham, 1858, 60, 65, 67, 80.
Fogg, John S. H.	Boston, 1865.
Folsom, Charles S.	Boston, 1879.
Folsom, Levi,	New Bedford, 1852, 55, 58.
Forsyth, F. F.	Weymouth, 1870.
Forsyth, James B.	Chelsea, 1851, 60, 65. (d. 1872.)
Foster, Edward J.	Charlestown, 1876.
Francis, T. E.	Brookline, 1865.
Frisbie, J. F.	Newton, 1880.

Fuller, H. H.	Charlestown, 1880.
Gage, Daniel P.	Lowell, 1865.
Gage, Thomas H.	Worcester, 1865.
Gallup, John S., (M.)	Boston, 1865.
Gardner, Johnson,	Pawtucket, 1860. (d. 1869.)
Garratt, Alfred C.	Boston, 1860, 64, 65, 76, 80.
Gay, George H.	Boston, 1851, 52, 53, 60, 65. (d. 1878.)
Giddings, Theodore,	Housatonic, 1876, 80.
Giddings, Wooster P.	Boston, 1876.
Gilbert, John H.	Quincy, 1876, 80.
Gilman, B. F.	Nantucket, 1852.
*Godding, Alvah,	Winchenden, 1860, 66. (d. 1875.)
Goodell, J. W.	Lynn, 1865.
Gordon, Charles,	Boston, 1849. (d. 1872.)
Gordon, Timothy,	Plymouth, 1849, 65. (d. 1877.)
Gordon, William A.	New Bedford, 1860.
*Gould, Augustus A.	Boston, 1849, 53, 54, 60, 65. (d. 1866.)
Gould, Joshua B., (E.P.M.)	Somerville, 1865.
Graves, John W.	Lowell, 1847, 49, 58, 64, 65, 68. (d. 1873.)
Gray, F. H.	Boston, 1865.
*Gray, James H.	Springfield, 1853. (d. 1853.)
*Green, John,	Worcester, 1848, 51, 52, 53, 54 V.P., 56, 58, 63, 64, 65. (d. 1865.)
Green, John O.	Lowell, 1858, 65, 70.
Greene, Francis C.	E. Hampton, 1860.
Greene, James S.	Dorchester, 1865.
Greene, John, (M.I.)	Boston, 1864.
Greene, M. C.	Boston, 1865, 67.
Greene, W. Warren,	Pittsfield, 1864.
Greer, Robert,	Boston, 1853, 64. (d. 1873.)
Gregerson, J. B., (M.)	Boston, 1849. (d. 1854.)
Grover, Geo. W.	Sheffield, 1872, 74.
Guiteau, Coridon,	Lee, 1849. (d. 1854.)
*Hale, Enoch,	Boston, 1848. (d. 1848.)
*Hall, Adino B.	Boston, 1860, 64, 65, 76. (d.)
Harlow, E. A. W.	Boston, 1865.
Harlow, James F.	Boston, 1865.
Harlow, J. M.	Woburn, 1865.
Harpur, John,	Sandwich, 1849. (d.)
Harris, James C.	West Cambridge, 1860, 65.
Haskell, Benjamin,	Rockport, 1849, 65. (d. 1878.)
Hay, Gustavus,	Boston, 1865.
Hayden, John C.	Boston, 1850. (d. 1869.)
Hayward, George,	Boston, 1849, 50, 51 V.P., 52, 55, 60. (d. 1863.)
Hayward, George, Jr.,	Boston, 1849, 65.
Heywood, Benjamin F.	Worcester, 1853, 54, 59, 64, 65, 68. (d. 1869.)
Hill, E. P., (M.)	1849.
Hitchcock, Alfred,	Fitchburg, 1849, 53, 54, 58, 60, 65, 68. (d. 1874.)
Hitchcock, Alfred O.	Fitchburg, 1876.
Hitchcock, J. G. S.	Foxboro, 1865.
Hodgden, Richard L.	West Cambridge, 1860, 65.
Holmes, Christopher C.	Milton, 1853, 55, 60, 65.
Holmes, Oliver Wendell,	Boston, 1847, 48, 49, 53, 65.
Holt, A. F.	Cambridgeport, 1880.
Homans, Charles D.	Boston, 1853, 54, 65.
Homans, John,	Boston, 1849, 55, 58, 60, 63, 65. (d. 1868.)

Hooker, Anson,	East Cambridge, 1855, 65. (d. 1869.)
Hooker, Anson P.	East Cambridge, 1855, 60. (d. 1873.)
Hooper, Foster,	Fall River, 1849, 60, 65, 68. (d. 1870.)
Hooper, Frederick H.	New Bedford, 1868, 80.
Hooper, Robert W.	Boston, 1849, 53.
Hoskins, Thomas H.	Boston, 1864.
Hosmer, Alfred,	Watertown, 1865.
Hosmer, Hiram,	Watertown, 1849. (d. 1862.)
Hovey, Daniel,	Greenfield, 1853. (1874.)
How, George T.	New Bedford, 1874, 78, 80.
Howard, Levi,	Chelmsford, 1865.
Howe, Appleton,	South Weymouth, 1852, 63. (d. 1870.)
Howe, Charles,	Taunton, 1860.
Howe, Zadock,	Billerica, 1849. (d. 1850.)
Hoyt, Enos,	Farmington, 1859, 60, 65. (d. 1875.)
Hubbert, C. M.	St. Dennis, 1865.
Hunt, Ebenezer,	Danversport, 1849, 65, 80.
*Huntington, Elisha,	Lowell, 1847, 49, 65. (d. 1865.)
Hurd, Samuel H., (E.P.M.)	Charlestown, 1860, 65.
Hurd, Yoreck G.	Amesbury, 1865.
Huse, Stephen,	Methune, 1855. (d. 1864.)
Hyde, George S.	Boston, 1865. (d.)
Inches, H. B.	Boston, 1849.
Ingalls, William,	Boston, 1860.
Irish, John C.	Lowell, 1878, 80.
Jackson, Charles T.	Boston, 1852, 53. (d. ~~1878~~.)
*Jackson, James,	Boston, 1849, 65. (d. 1867.)
Jackson, J. B. S.	Boston, 1849, 54, 65. (d. 1879.)
Jarvis, Edward,	Dorchester, 1849, 65.
Jarvis, John F.	Boston, 1864, 65, 68, 80.
Jeffries, B. Joy,	Boston, 1860, 64, 65, 80.
Jeffries, John,	Boston, 1847, 53. (d. 1876.)
Jennings, Selden,	Richmond, 1848. (d. 1864.)
Jewett, Charles C., (E.P.M.)	Hollister, 1865.
Jewett, George, (E.P.M.)	Fitchburg, 1865, 76, 80.
Jewett, H. A.	Northboro, 1864, 65.
Jewett, Jeremiah P., (E.P.M.)	Lowell, 1849, 53, 60, 65. (d. 1870.)
Johnson, Wm. Otis,	Boston, 1865. (d. 1873.)
Jones, Daniel W., (M.)	Boston, 1877.
Jones, Geo. Stevens,	Boston, 1865.
Jones, Henry N.	Kingston, 1865.
Jones, Joseph S.	Boston, 1865. (d. 1877.)
Keep, N. C.	Boston, 1853. (d. 1875.)
Kemp, Alba E., (E.P.M.)	New Salem, 1865.
Kendall, Pierson T.	Clinton, 1859, 60, 63. (d. 1865.)
Kimball, Gilman,	Lowell, 1848, 49, 50, 53, 55, 58, 60, 64, 65, 77, 80.
Kittredge, Theodore,	Waltham, 1856. (d. 1879.)
Lamb, Wm. D.	Laurence, 1853, 56, 58, 60, 65, 67.
Lambert, Alfred,	Springfield, 1849, 64.
Lamson, John A.	Boston, 1865.
Lawton, Sanford,	Springfield, 1880.
Lathrop, W. H.	Tewksbury, 1880.
Learned, E. T.	Fall River, 1872.
Learned, John B.	Florence, 1876.
Leavitt, Wm. H.	W. Stockbridge, 1878.
Leighton, Walter H.	Lowell, 1880.
*Leland, Francis,	Milford, 1855, 60, 65. (d. 1867.)
Leonard, Jonathan,	Sandwich, 1849.
Leonard, M. Bloomfield,	East Boston, 1856, 65.

Lewis, Winslow,	Boston, 1855. (d. 1875.)
Livingston, Alfred,	Lowell, 1864. (d. 1876.)
Livingston, F. L., (M.I.)	Barrett, 1864.
Lombard, J. S., (E.P.M.)	Boston, 1865.
Longenecker, J. H., (E.P.M.)	Feltonville, 1865.
Loring, Geo B., (M.)	Boston, 1849.
Lovejoy, Oliver S.	Haverhill, 1864, 65.
Lowell, Ephraim,	West Boylston, 1854, 56. (d. 1869.)
Lyman, George H.	Boston, 1849, 55, 60, 65, 76.
Lyman, William W., (M.)	Boston, 1855.
Lynde, James P.	Athol, 1863, 65.
McCallister, J. Q. A., (E.P.M.)	Groton, 1865.
Mack, William,	Salem, 1849, 65.
Mackie, Andrew,	New Bedford, 1849, 65. (d. 1871.)
Mackie, John H.	New Bedford, 1865.
McLean, Alexander, (E.P.M.)	Springfield, 1865.
Mann, Benjamin, (E.P.M.)	Roxbury, 1865. (d. 1874.)
Mansfield, J. D.	South Reading, 1850, 65.
Marcy, Henry O.	Cambridgeport, 1876, 77, 78, 79, 80 v.p.
Marsh, Lebinus E.	Wales, 1864.
Marshall, Jonas A.	Fitchburg, 1860.
Martin, Henry A.	Boston, 1868, 76, 77, 78, 80.
Martin, Oramel,	Worcester, 1856, 60, 65, 70, 78.
Martin, S. P.	New Braintree, 1864, 65. (d. 1873.)
Martin, S. C.	Roxbury, 1880.
Mason, Augustus,	Brighton, 1864, 65, 66, 67, 68, 72, 80.
Mather, E. E.	Williamstown, 1880.
Mead, E.	Roxbury, 1880.
Meekins, Thomas,	Williamsburg, 1865.
Metcalf, John Geo.	Mendon, 1849, 55, 65.
Mifflin, Charles, (M.)	Boston, 1849. (d. 1875.)
*Miller, Alfred,	Fitchburg, 1864. (d. 1877.)
Miller, Erasmus D.	Dorchester, 1853, 55, 56, 60, 64, 65.
Miller, E. P.	Fitchburg, 1880.
Miller, J. Leland,	Pittsfield, 1865.
Millett, Asa,	Bridgewater, 1865.
Miner, David W., (E.P.M.) (M.I.)	Ware, 1865, 78, 80.
Minot, Francis,	Boston, 1854, 65.
*Monroe, Alex. Le Baron,	Medway, 1855, 58, 65, 75. (d. 1879.)
*Moore, Edward B.	Boston, 1855, 65, 71, 73. (d. 1874.)
Moriarty, John M.	Boston, 1849, 58. (d. 1865.)
Morland, W. W.	Boston, 1849, 55, 65, 75. (d. 1876.)
Morrill, Samuel,	Boston, 1849, 65. (d. 1872.)
Morrison, James,	Quincy, 1875, 76, 80.
Morse, Edward G.	Boston Heights, 1870.
Morse, Jos. R.	North Cambridge, 1865.
Morse, Luther B.	Watertown, 1850, 65.
Mowe, Daniel,	Lowell, 1849. (d. 1860.)
Murphy, J.	Taunton, 1865, 68.
Nicholas, Geo. H.	Boston, 1865.
Norcross, Josiah,	South Reading, 1858, 65. (d. 1866.)
Norfolk, Walter J.	Westfield, 1878.
Norris, Albert L.	East Cambridge, 1876, 77, 80.
Noyes, Josiah,	Needham, 1853, 65. (d. 1871.)
Nutting, D. H.	Cherokee Falls, 1880.
Nye, James M.	Lynn, 1849, 53, 60, 64, 65. (d. 1872.)
Odin, John, Jr.,	Boston, 1849. (d. 1864.)
Oliver, Fitch E.	Boston, 1860, 65.
Orcott, Almon M.	Herdwich, 1860, 64, 65, 78.
*Ordway, John P.	Boston, 1865, 66. (d.)

Osgood, Jonathan W. D.	Greenfield, 1853, 60, 64, 65, 72, 73, 74.
Otis, George A.	Springfield, 1860.
Paddock, Frank K.	Pittsfield, 1880.
Page, Calvin G.	Boston, 1860, 65. (d. 1869.)
Page, Horatio N.	Chelsea, 1865, 74.
Page, W. H.	Boston, 1855, 65.
Palmer, Edward D. G.	Boston, 1855, 65. (d. 1869.)
Parker, D. M.	Boston, 1865.
Parker, Hiram,	Lowell, 1860. (d. 1877.)
Parker, Moses,	Melrose, 1865.
Parker, Moses G.	Lowell, 1877, 80.
Parker, W. T., (M.)	Boston, 1849. (d. 1855.)
Parkman, George,	Boston, 1849. (d. 1849.)
Parkman, Samuel,	Boston, 1847, 49, 51. (d. 1854.)
Parks, Luther, Jr.,	Boston, 1849, 55, 65.
Patch, Franklin Fletcher,	Boston, 1865.
Peck, William D.	Sterling, 1849.
Peirson, Abel Lawrence,	Salem, 1847, 48, 53. (d. 1853.)
Peirson, E. B.	Salem, 1849. (d. 1874.)
Perkins, Edward A.	Boston, 1864, 65.
Perkins, Geo. A.	Salem, 1865.
Perkins, Henry C.	Newburyport, 1849, 60, 65. (d. 1873.)
Perkins, John P.	Great Barrington, 1856. (d. 1856.)
Perry, Marshall S.	Boston, 1849, 50. (d. 1859.)
Phelps, R. H.	Littleton, 1880.
Phelps, Thaddeus,	Attleborough, 1853, 60, 64, 65, 66, 67.
Pierce, G. W.	Leominster, 1865.
Pierce, John,	Edgartown, 1849.
Pillsbury, Harlin,	Lowell, 1860. (d. 1877.)
Pillsbury, Harlin H.	Medford, 1864, 65, 66
Pillsbury, J. D.	Lowell, 1849. (d. 1856.)
Pineo, Peter,	Hyannis, 1872, 80.
Pinkerton, George E.	Lowell, 1880.
Pinkham, J. G.	Lynn, 1880.
Pond, Benjamin,	Westborough, 1849. (d. 1857.)
Poole, Alexander,	Chelsea, 1849, 65. (d. 1878.)
Porter, Joshua, Jr.,	North Brookfield, 1860. (d. 1874.)
Pratt, Calvin B.	Bridgewater, 1860. (d. 1862.)
Pratt, Jefferson,	Hopkinton, 1856, 58, 60, 64, 65, 68, 70.
Presbury, Silas D., (E.P.M.)	Taunton, 1865.
Puffer, Chenery,	Shelburne Falls, 1864, 65, 66. (d. 1877.)
Putnam, Charles G.	Boston, 1849, 65. (d. 1875.)
Putnam, Charles P.	Boston, 1876.
Read, Wm.	Boston, 1865.
Reynolds, Edward,	Boston, 1849, 50, 53.
Reynolds, John P.	Boston, 1865.
Reynolds, Joseph,	Concord, 1848, 49, 65. (d. 1872.)
Rice, Charles H.	Fitchburg, 1880.
Rice, David,	Leverett, 1865.
Richards, Wolcott,	Roxbury, 1865.
Richardson, Horace,	Boston, 1855, 58, 60, 64, 65, 72.
Richardson, Samuel,	Watertown, 1853, 65. (d. 1879.)
Robbins, James W.	Uxbridge, 1849, 58. (d. 1879.)
Robinson, J. Henry,	Southborough, 1865.
Robinson, John R., (M.)	1860.
Robinson, W. S.	Taunton, 1880.
Root, Martin,	Byfield, 1855, 60, 64, 65.
Root, O. S.	Pittsfield, 1855, 65.
Ruppaner, A.	Boston, 1865.
Russell, Frederick W.	Winchendon, 1876.
Russell, Henry,	Boston, 1865.

Russell, Ira,	Nattuck, 1858, 60, 78, 80.
Russell, Le Barron,	Boston, 1849.
Sabin, Henry L.	Williamstown, 1864.
*Salisbury, Stephen,	Brookline, 1852, 60. (d. 1875.)
Salter, Richard H.	Boston, 1860.
Sampson, Ira, (M.)	Taunton, 1853. (d. 1871.)
Sargent, Henry,	Worcester, 1855, 56. (d. 1858.)
Sargent, Joseph,	Worcester, 1855, 64, 65.
Sargent, Seneca,	Lawrence, 1858, 60. (d. 1873.)
Saville, Henry M.	Boston, 1865.
Savory, Charles A.	Lowell, 1865, 70, 77.
Sawyer, Edward J.	Gardner, 1878, 80.
Sawyer, Edwin, (E.P.M.)	Springfield, 1865.
Sawyer, F. A.	Wareham, 1873, 80.
Séquard, E. Brown, (E.P.M.)	Boston, 1864, 66.
Seymour, Lewis Dwight,	Greenfield, 1860. (d. 1873.)
Shackford, Charles H.	Chelsea, 1865, 80.
Shattuck, George C.	Boston, 1847, 58, 59, 60, 65.
Shaw, Benjamin S.	Boston, 1865.
Shelden, L. R.	Boston, 1865. (d. 1873.)
Shurtleff, Augustin,	Brookline, 1853, 55.
Shurtleff, Nathaniel B.	Boston, 1849, 65. (d. 1874.)
Sinclair, Alexander D.	Boston, 1864, 65, 76.
Slade, Daniel D.	Boston, 1865.
Smith, B. F., (M.)	Amherst, 1853. (d. 1865.)
Smith, David P.	Springfield, 1860.
*Smith, James M.	Springfield, 1851, 53. (d. 1853.)
Smith, Jerome C.	Somerville, 1860.
Smith, J. V. C.	Boston, 1847, 49.
Smythe, Jas.	Boston, 1865.
Snow, A. B.	Boston, 1849. (d 1864.)
Snow, George W.	Newburyport, 1876.
Southwick, Moses D.	Millville, 1863, 65. (d. 1874.)
Spalding, Joel,	Lowell, 1864, 65.
Spalding, Leonard,	Millbury, 1866. (d. 1872.)
Spalding, Miles,	Groton, 1849, 60, 65.
Spofford, Jeremiah,	Greenville, 1849, 65.
Spooner, John P.	Milton, 1849, 65. (d. 1878.)
Spooner, Paul,	New Bedford, 1848, 49, 50. (d. 1862.)
Sprague, Francis P.	Boston, 1864, 65.
Sprague, Seth L.	Boston, 1853, 55, 65.
Stedman, Charles H.	Boston, 1848, 49, 65.
Stedman, Joseph,	Jamaica Plains, 1876, 77.
Stetson, James A.	Quincy, 1860.
Steven, W. F.	Stoneham, 1849.
Stevens, Francis J.	Haverhill, 1864.
Stickney, Charles D.	New Bedford, 1860, 68.
Stimson, Jeremy,	Dedham, 1849, 50, 55. (d. 1869.)
Stone, Eben,	Walpole, 1860, 63. (d. 1869.)
Stone, Henry O.	Salem, 1853.
Stone, James W.	Boston, 1850, 54.
*Stone, Joseph,	Hardwick, 1849. (d. 1849.)
Stone, L. R.	Newton, 1880.
Storer, D. Humphrys,	Boston, 1849, 50, 51, 52, 53, 54, 55 v.p., 60, 65, 66 p., 67.
Storer, Horatio R.	Boston, 1856, 64, 65, 66, 67, 68 v.p., 70, 71.
Strathan, Elijah,	Northfield, 1860. (d. 1876.)
Street, Charles,	Boston, 1865.
Sullivan, John L.	Malden, 1864, 65, 70.
Sumner, A. M.	Boston, 1880.

Swasey, Charles L.	New Bedford, 1868.
Taylor, Ashman H.	Shelburn Falls, 1856, 64, 65.
Taylor, John B.	East Cambridge, 1860, 65, 80.
Taxter, Duncan McB.	Boston, 1860, 64, 65. (d. 1873.)
Theayer, W. H., (M.)	Boston, 1849.
Thomas, Alexander.	Cambridge, 1852, 65.
Thomas, Alexander T.	Boston, 1855.
Thompson, Abraham R., (M.)	Charlestown, 1849. (d. 1866.)
Thompson, Austin W.	Northampton, 1865, 80.
Thompson, Daniel, (M.)	Northampton, 1849, 53.
Thompson, James,	Northampton, 1856. (d. 1859.)
Thomson, Geo. N.	Boston, 1864, 65, 71.
Thomson, Horatio,	Belchertown, 1860. (d. 1860.)
Thorndike, Wm.	Beverly, 1860.
Thorndike, Wm. H.	Boston, 1865.
Toothaker, Samuel A.	Wilmington, 1865.
Torrey, Augustus,	Beverly, 1865.
Towle, Samuel K.	Haverhill, 1865.
Townsend, George J.	South Notch.
Townsend, Solomon D.	Boston, 1849, 53, 59, 60. (d. 1869.)
Townsend, Wm. E.	Boston, 1865. (d. 1866.)
Tracy, Stephen,	Andover, 1864. (d. 1873.)
Tripp, Benj. H.	Rutland, 1864. (d 1873.)
Trow, W. M.	Haydenville, 1864.
Trueworthy, E. E.	Lowell, 1878.
Tuck, Henry,	Boston, 1870.
Tucker, E. G., (M.)	Boston, 1853.
Tucker, George G.	Westfield, 1865, 70, 72, 80.
Tucker, Joshua,	Boston, 1865
Tucker, Simeon,	Stoughton, 1865. (d. 1878.)
Tyler, John E.	Somerville, 1865. (d. 1878.)
Upham, J. Baxter.	Boston, 1859, 60, 65.
Vaughn, Charles E.	Cambridge, 1876.
Vermyne, J. J. B.	New Bedford, 1880.
Wakefield, Horace P.	Reading, 1858, 65.
Wakefield, J. F.	South Malden, 1865.
Wales, Bradford L.	Randolph, 1849.
Walker, Clement A.	Boston, 1865, 66, 67, 76, 77, 80.
Ward, George A.	Holyoke, 1864.
Ward, Geo. Whitfield,	Ripton, 1865.
Ware, Charles E.	Boston, 1853, 65.
*Ware, John.	Boston, 1848, 49, 50. (d. 1864.)
Ware, Jonathan,	Milton, 1849, 52, 58, 60, 65. (d. 1877.)
Warner, Levi F.	Boston, 1873, 74 V.P., 75, 76, 77, 78, 79, 80.
Warren, George A.	Hopkinton, 1860, 70.
Warren, John C.	Boston, 1848 V.P., 49 P., 50, 53. (d. 1856.)
Warren, J. Collins,	Boston, 1870.
Warren, J. Mason.	Boston, 1849, 53, 55, 65. (d. 1867.)
Warren, Joseph H.	Boston, 1865, 79, 80.
Warren, John W.	Boston, 1849, 65. (d. 1869.)
Warren, Royal S.	Waltham, 1865.
Waterman, J. H., (E P.M.)	Westfield, 1865, 78.
Watson, A. A.	Boston, 1849, 65. (d. 1868.)
Webber, Samuel G., (E.P.M.)	Boston, 1865.
Weeks, A. P.	Chelsea, 1880.
Weld, Moses William.	Boston, 1853, 65.
Wellington, Timothy,	West Cambridge, 1850. (d. 1853.)
Wellington, W. W.	Cambridge, 1865, 66.
Wells, David, (M.)	Lowell, 1849. (d. 1876.)

West, Joseph O.	Princeton, 1865.
Wheatland, Rich. H.	Salem, 1858. (d. 1863.)
Wheeler, William G.	Chelsea, 1853, 60, 65, 77.
Whitcomb, Charles W.	Barre, 1864, 65.
Whittaker, John B.	Fall River, 1872.
White, E. S.	Summerville, 1880.
White, James C.	Boston, 1865.
White, Vassal,	Curtisville, 1853. (d. 1856.)
Whiting, Aug.	Charlestown, 1858. (d. 1867.)
Whiting, Joseph B.	Lee, 1860.
Whitney, Simon,	Farmington, 1849. (d. 1861.)
*Whitridge, Wm. C.	New Bedford, 1853. (d. 1857.)
Wigglesworth, Edward,	Boston, 1876, 78.
Wilcox, Chauncy, (M.)	Uxbridge, 1865.
Wilde, James,	Duxbury, 1860, 65.
Wilder, Charles W.	Leominster, 1850. (d. 1851.)
Wiley, Adams,	Roxbury, 1853. (d. 1860.)
Willard, Henry,	Boston, 1855. (d. 1855.)
Williams, A. G.	North Adams, 1865.
Williams, Henry W.	Boston, 1853.
*Williams, Stephen W.	Deerfield, 1847, 49. (d. 1855.)
Willis, Isaac P.	Royalston, 1860. (d. 1863.)
Willis, John W.	Waltham, 1868, 80.
Wilter, John,	Hampton, 1864.
Wing, Clifton E.	Boston, 1877.
Winslow, Frederick, (E.P.M.)	Winchester, 1865.
Winslow, Joseph W. (E.P.M.)	East Hampton, 1865.
Woodward, Rufus,	Worcester, 1880.
Worcester, Edward, (M.)	1853.
Workman, William,	Worcester, 1853, 55, 60, 65, 66, 68.
Wright, E.	Lee, 1870.
Wright, J. H.	Natick, 1880.
Wyman, Jeffries, (M.)	Cambridge, 1849, 52. (d. 1874.)
Wyman, Morrell, (M.)	Cambridge, 1849.
Yale, John, (E.P.M.)	Ware, 1865, 66, 76, 80.
York, Joseph H.	Boston, 1855, 60. (d. 1874.)

MICHIGAN.

Alden, C. H.	Fort Gratiot, 1872.
Allen, J. Adams,	Ann Arbor, 1850.
Andrews, George Pierce,	Detroit, 1869.
Andrews, Josiah,	Detroit, 1853, 56, 74, 76, 78.
Andrews, M. H., (M. I.)	Jonesville, 1856.
Andrews, S. L.	Romeo, 1874.
Armor, Samuel G.	Detroit, 1864, 66.
Arnold, S. R.	Monroe, 1856. (d. 1874.)
Ashley, C. F., (M. I.)	Ypsilanti, 1856.
Axford, Samuel M.	Flint, 1855. (d. 1874.)
Backus, Chas. W.	Three Rivers, 1872, 75, 76.
Bailey, Fred K.	Alenout, 1853.
Baker, Henry B.	Lansing, 1874, 75.
Banks, Gertrude L.	Detroit, 1880.
Barker, A. P., (M.)	Saginaw City, 1874.
Barnes, H. B.	Ionia, 1875.
Barnum, Boliver,	Jackson, 1856, 71, 74, 75.
Bates, Noah,	Flint, 1880.
*Beech, J. H.	Coldwater, 1854, 55, 75, 77. (d. 1878.)
Bell, John,	Benton Harbor, 1874, 77.

Bennett, John,	Centerville, 1859.
Bennett, J. H., (M)	Coldwater, 1877.
Bessac, H. B.	Milan, 1876.
Bingham, Ira P., (M.)	Brighton, 1878.
Bliss, Lyman W.	Saginaw, 1874, 75, 80.
Bose, Eugene,	Grand Rapids, 1880.
Book, J. B.	Detroit, 1870, 74, 75, 77, 78, 80.
Borrowman, Andrew,	Detroit, 1874, 77, 78, 79, 80.
Brady, John,	Grand Rapids, 1874, 78.
Breakey, W. F.	Ann Arbor, 1877, 80.
Briggs, D. C., (M.I.)	1856.
Briggs, Thomas H.	Mattawan, 1877.
Bristol, S. H.	Parma, 1878.
Brodie, William,	Detroit, 1854, 55, 56, 57, 59, 60, 65, 73, 74, 75 v.p., 76, 77, 78, 79, 80.
Brown, Isaac E.	Monroe, 1876, 77, 78, 80.
Brown, James A.	Detroit, 1856, 73, 74, 75, 76, 77, 78, 79.
Brownell, Wm.	Utica, 1874, 80.
Brumme, Carl,	Detroit, 1874, 78, 80.
Buchnum, Amos M.	Parma, 1877, 79.
Buckham, Thomas R.	Flint, 1874, 77.
Calkins, A. R.	Allegon, 1872. (d. 1873.)
Campbell, A. B.	Ovid, 1878.
Casstens, J. Henry,	Detroit, 1876, 77, 80.
Chapin, Andrew B.	Flint, 1874, 77.
Chapin, E. B.	Grass Lake, 1874.
Chapman, C. H.	Grand Crossing, 1877.
Chapoton, E. A.	Detroit, 1877.
Chittock, Gordon,	Jackson, 1873, 74, 75, 77, 78, 80.
Christian, E. P.	Wyandott, 1856, 76.
Claflin, Nelson H.	East Saginaw, 1874.
Clapham, Edward,	Kalamazoo, 1866.
Clapp, Horace C.	Mendon, 1856, 74.
Clark, James,	Bay City, 1876.
Coates, J. R., (M.I.)	1856
Cobb, H. P.	Detroit, 1856. (d.)
Cobb, L. H.	Detroit, 1857. (d.)
Cogshall, Bela,	Flint, 1877.
Cone, E. D.	Hillsdale, 1856.
Conner, Leartus,	Detroit, 1874, 75, 76, 77, 78, 79, 80.
Coope, A. F.	Flushing, 1874
Cox, Edward, (M.I.)	Battle Creek, 1856, 77, 78.
Crosby, Amos,	Albion, 1877, 78.
Cruickshank, C. G.	Howell, 1878.
Curtis, P. N., (M.I.)	1856.
Cutter, S. S.	Coldwater, 1877, 78.
Davenport, Lewis,	Detroit, 1857, 58, 63.
De Camp, Wm. H.	Grand Rapids, 1867, 74.
Dellenbaugh, C. C.	Portland, 1877, 78, 80.
Denton, Samuel,	Ann Arbor, 1856. (d.)
Dickinson, Wm. L.	East Saginaw, 1880.
Ditman, W. R.	North Adams, 1877.
Douglass, S. H.	Ann Arbor, 1856, 71, 74.
Dunning, Edward B.	Pawpaw, 1878.
Dunning, L. H.	New Troy, 1876.
Dunster, E. S.	Ann Arbor, 1877, 78, 79, 80.
Egery, Edward A.	Three Rivers, 1863.
Elliott, W. N.	White Pigeon, 1874, 76, 77.
Ewers, H. F., (M.I.)	Union City, 1856, 76, 77.
Ewing, Alex., (M.I.)	Dexter, 1856. (d. 1879.)

Fairbank, Henry Carleton,	Flint, 1869, 72, 74, 77, 80.
Fairchild, B. H.	Detroit, 1874.
Falley, J. W.	Hillsdale, 1875.
Fanner, C. P.	Ann Arbor, 1856.
Fares, J. B.	Romeo, 1874.
Farrand, D. O.	Detroit, 1874, 76, 77.
Fasquielle, Louis W.	St. Johns, 1874, 75, 76, 77, 78, 80.
Fiske, I. W.	Kalamazoo, 1873, 76.
Ford, Corydon L.	Ann Arbor, 1860, 65, 74, 76.
Foster, ——, (M.I.)	1856. (?)
Foster, Leonard,	Otsego, 1874, 76.
French, Simeon S.	Battle Creek, 1856, 77, 78.
French, S. B., (M.I.)	Battle Creek, 1856.
Frothingham, George E.	Ann Arbor, 1874, 75, 76, 78.
Gilbert, C. B., (M.)	Detroit, 1874.
Gorton, J. C.	Detroit, 1856. (d.)
Green, Geo. H.	Burlington, 1876.
Green, Geo. W.	Grand Crossing, 1874.
Green, M. L.	Pontiac, 1865. (d.)
Greenshields, Wm.	Romeo, 1874.
Griswald, Jos. B.	Grand Rapids, 1876.
Gunn, Moses,	Detroit, 1856, 57, 59.
Gundrum, F.	Ionia, 1880.
Gustin, Wm. C.	Detroit, 1874.
Hagadorn, J. W.	Lansing, 1877.
Hagadorn, S. H.	Bay City, 1880.
Hall, Daniel,	Saline, 1874.
Hall, Ebenezer,	Saline, 1875.
Hamilton, J. S.	Tecumseh, 1874, 77.
Harvy, James,	Romeo, 1874.
Hatch, H. B.	Three Rivers, 1877.
Hauxhurst, D. C.	Battle Creek, 1878.
Hayden, C. N.	Eaton Rapids, 1874.
Haze, W. H.	Farmington, 1856.
Hazlewood, Arthur,	Grand Rapids, 1874, 75.
Heaton, A. S.	Detroit, 1874, 76, 78.
Herrick, O. E.	Greenville, 1874.
Hitchcock, Homer O.	Kalamazoo, 1863, 64, 65, 74, 78.
Holly, ——, (M.I.)	Shawasse, 1856.
Hoyt, Jos. M.	Walled Lake, 1875.
Huff, H. G.	White Pigeon, 1880.
Hutton, R. C.	Howell, 1878.
Ikeler, Wm. M.	Three Rivers, 1877.
Inglis, R.	Detroit, 1856. (d. 1875.)
Jenks, Edward Watrous,	Detroit, 1863, 65, 69, 70, 74, 75, 76, 77, 78.
Jerome, James H.	Saginaw, 1875, 77, 79, 80.
Johnson, George K.	Grand Rapids, 1850, 73, 74, 76, 77, 79, 80.
Johnson, J. G.	Detroit, 1874.
Kaiser, Augustus,	Detroit, 1876, 78, 80.
*Kane, Edward,	Detroit, 1871, 74. (d. 1875.)
Kapp, John,	Ann Arbor, 1876, 77, 80.
Kedzie, Robert C.	Lansing, 1872, 73, 74, 76, 79.
Kelsey, W. J.	Cassopolis, 1874, 75, 76, 77.
Kibbee, Jarad,	Port Huron, 1856.
Kimball, Amy Garrison,	Jackson, 1878, 80.
King, S. C.	Ovid, 1880.
Kinne, A. F.	Ypsilanti, 1874.
Kinney, M. C.	Lapeer, 1856, 74.
Klein, Peter,	Lansing, 1856, 58, 74, 78.

Knight, Philip A.	Utica, 1880.
Knowles, L. D.	Three Rivers, 1880.
Landon, Henry B.	Bay City, 1874.
Langlois, T. J.	Wyandot. 1874, 75, 77, 78.
Leach, E.	Owasa, 1856.
Leasid, James A.	Williamstown, 1856.
*Leete, Albert C.	Romeo, 1856, 64, 74. (d. 1878)
Leland, Aaron L.	Detroit, 1853, 55, 56. (d. 1858.)
Leonard, C. Henri,	Detroit, 1878, 80.
Lewis, Charles H.	Jackson, 1877, 79.
Lomis, Harvey,	Burr Oak, 1875.
Lovewell, C. H.	Coldwater, 1877.
Lystér, Henry F., (M.)	Detroit, 1874, 77.
McColl, Hugh,	Lapeer, 1874, 78.
McCullum, C.	Romeo, 1856.
McGraw, Theodore A.	Detroit, 1873, 74, 75, 77, 78, 79.
McHench, Wm. J.	Brighton, 1876.
McLean, Donald,	Ann Arbor, 1875, 76, 77, 78.
Maniates, R. K., (M.I.)	Marshall, 1856. (d.)
Mason, John M., (M.)	Detroit, 1874.
Miller, J.	Mt. Pleasant, 1880.
Mills, H. R.	Port Huron, 1874.
Morrison, Thorn,	Wayne, 1874.
Mulheron, Jas.	Greenville, 1874.
Mulheron, J. J.	Detroit, 1874.
Munson, James D.	Pontiac, 1878.
Murray, Andrew,	Niles, 1854. (d)
Murray, R. N.	Flint, 1876, 77, 80.
Nash, Alfred,	Lapeer, 1872.
*Nims, Dwight,	Jackson, 1856, 58, 74, 77. (d. 1879.)
North, John D.	Jackson, 1874, 77, 78.
North, George I., (E.P.M.)	Marquette, 1878.
Noyes, James F.	Detroit, 1873, 74, 75, 77, 78, 80.
Oakley, F. M.	York, 1874, 75, 77.
Oakley, J. J.	Detroit, 1874. (d.)
O'Donoughue, W., (M.I.)	Battle Creek, 1856.
Owen, Frank K.	Ypsilanti, 1876, 77, 78.
Packard, Nelson J.	Sturgis, 1874, 79.
Paddock, Isaac,	Pontiac, 1853, 55, 56, 60. (d.)
Palmer, A. B.	Ann Arbor, 1850, 54, 55, 57, 58, 60 V.P., 63, 64, 67, 68, 69, 76, 78.
Patterson, M. A.	Tecumseh, 1856. (d.)
Patterson, P. D.	Charlotte, 1878.
Pierce, James L.	Corunna, 1847.
*Pitcher, Zina,	Detroit, 1850, 52, 53, 55, 56 P., 57, 58, 59, 65. (d. 1872)
Platt, Alonzo,	Grand Rapids, 1856.
Porter, Moses,	Kalamazoo, 1874, 76.
Potter, A. O.	Ann Arbor, 1856.
Pratt, Foster,	Kalamazoo, 1874, 76, 77, 78, 79, 80.
Price, E.	Jackson, 1876.
Ranney, George E.	Lansing, 1874, 76, 77, 78, 80.
Reynolds, Thomas N.	Detroit, 1878, 79, 80.
Rice, R. S.	Detroit, 1856 (d.)
Richardson, S. D.	Three Rivers, 1863.
*Robinson, G. L.	Detroit, 1856, 57. (d. 1858.)
Root, Wm. W.	Mason, 1877.
Ross, Benj. B., (X.)	East Saginaw, 1874.
Rouse, J. S.	South Saginaw, 1874.
Rouse, W. H.	Detroit, 1874.
Russell, Geo. B.	Detroit, 1856.

Rutherford, Frances A., (M.)	Grand Rapids. 1877.
Sabine, Mardin,	Centreville. 1875.
Sackrider, Charles H.	Mason, 1878.
*Sager, Abner,	Ann Arbor, 1856, 58, 72. (d. 1877.)
Saunders, —— (M.I.)	1856.
Scott, Alex. H.	St. Joseph, 1877.
Seely, T. P.	Ann Arbor, 1856.
Shank, R. J.	Lansing, 1874.
Shelden, Chas. S.	Greenville, 1874.
Shepard, Chas.	Grand Rapids, 1856. 72.
Shurley, Ernest L.	Detroit, 1874, 77, 78, 80.
Sinclair, Alexander G., (M.)	Detroit, 1877.
Slaight, Andrew,	Grand Blanc, 1880.
Smart, Anson R., (M.)	Hudson, 1877, 79, 80.
Smith, Eugene,	Detroit, 1873, 74. 75, 77, 78, 79, 80.
Smith, Hamilton E.	Detroit, 1874, 78, 80.
Smith, John S.	Armada, 1856.
Smith, Newcomb S.	Flushing, 1877. 78.
Snooks, J. M.	Kalamazoo, 1880.
Snow, Edward S.	Dearbornville, 1875, 78, 80.
Snyder, I., (M.I.)	1863.
Southard, W. B.	Kalamazoo, 1873.
Southorn, Wm. B., (M.I.)	Kalamazoo, 1864.
Southworth, Charles T.	Monroe, 1867, 74.
Spencer, Clark E.	Fort Gratiot, 1874.
Stebbins, N. D.	Detroit, 1855, 56.
Stebbins, Wm. H., (M.I.)	Saline, 1856.
Stephenson, Robert,	Adrian, 1876, 77, 78. 80.
Stevens, Luman,	Three Rivers, 1871, 74, 76.
Stevens, M. B.	Byron, 1875.
Stevens, W. H., (M.I.)	Saline, 1856.
Stewart, Edwin,	Mendon, 1873.
Stewart, Morse,	Detroit, 1856.
Stewart, Morse, Jr.,	Detroit, 1880.
Stewart, Peter,	Detroit, 1874.
Stockwell, Cyrus M.	Port Huron, 1856, 60, 64, 65, 66, 72, 74.
Stoddard, J.	Albion, 1876.
Stone, A. R.	Almont, 1856.
Taylor, A. C.	Manchester, 1878.
Taylor, Henry,	Mount Clemens, 1853, 55, 56. (d.)
Thomas, Henry F.	Allegan, 1877.
Thomas, J. R.	Bay City, 1867, 74. 76, 77, 80.
Thompson, A. A.	Lansing, 1874, 75. 76.
Thompson, Albert,	South Haven, 1874.
Thornton, E. R., (M.I.)	Belleville, 1856.
Thornton, T. F.	Sturgis, 1875.
Tillson, Philo,	Romeo, 1856, 64.
Todd, Daniel,	Adrian, 1877, 78.
Tomlinson, Mark W., (M.)	Battle Creek, 1877.
Tompkins, Leander D.	Cassopolis, 1856.
Topping, George W.	De Witt, 1872, 74, 76, 78.
Town, W. B.	Geneva, 1878.
Tripler, Charles S.	Detroit, 1850. (d.)
Tucker, Charles S.	Coldwater, 1875.
Tupper, Horace,	Bay City, 1875, 76, 77, 78, 80.
Twiss, J. Edward,	Athens, 1877.
Tyler, C. V.	Bay City, 1875, 76, 77, 78, 80.
Van Deusen, E. H.	Kalamazoo,
Walker, Henry O.	Detroit, 1874, 80.

Ward, E. B.	Lansingburg, 1877.
Webb, Nathan,	Ypsilanti, 1874, 75.
Wells, B. P., (M.)	1856.
Wells, E., (M.)	1856.
Whelan, A. F.	Hildale, 1874.
White, Edmond G., (M.)	1876.
White, John B.	Saginaw, 1856, 67, 69, 74, 77.
Wilson, James C.	Flint, 1874, 76.
Woodman, L. C.	South Haven, 1874.
Wyman, Hal C.	Blussfield, 1878, 79.
Yemans, C. G.	Detroit, 1877.
Yuill, W. R.	Ft. Wayne, 1880.

MINNESOTA.

Adams, Charles Powell,	Hastings, 1871, 77, 78, 80.
Ames, Albert Alonzo,	Minneapolis, 1871.
*Ames, Alfred E.	Minneapolis, 1871. (d. 1874.)
Bartlett, C. K., (E.P.M.)	St. Peters, 1877.
Blood, Solomon,	Awatonna, 1877.
Bowers, Jacob E.	St. Peters, 1874.
Brooks, D. F.	Minneaska, 1876.
Craft, J.	Worthington, 1878.
Cross, E. C.	Rochester, 1872, 74, 75, 76, 77.
Cross, E. W., (E.P.M.)	Rochester, 1877, 80.
Finch, J. E.	Hastings, 1872.
Flagg, S. D.	St. Paul, 1878.
Gilmore, A. P.	Winona, 1877.
Goodrich, Calvin G.	Minneapolis, 1872, 76.
Hand, D. W.	St. Paul, 1860, 75.
Hewitt, Charles Nathaniel,	Redwing, 1869, 72.
*Hill, Nathan B.	Minneapolis, 1871. (d. 1875.)
Jones, Talbot, (M.I.)	St. Paul, 1880.
Le Boutillier, Charles W.	St. Anthony, 1856. (d. 1863.)
Lincoln, W. L.	Wabashaw, 1876.
McFeely, Joseph, (M.I.)	St. Anthony, 1871.
McGaughey, Jas. B.	Winona, 1872, 77.
Mays, W. W.	Rochester, 1870.
Milligan, Francis H., (M.)	Wabashaw, 1873, 80.
Murphy, John H.	St. Paul, 1854, 77, 78, 79 v.p.
*Potts, Thos. R.	St. Paul, 1856. (d. 1873.)
Rhodes, James C., (M.)	Stillwater, 1877.
*Richardson, W. H. H.	Winona, 1872. (d. 1873.)
Smith, V.	Duluth, 1878.
Staples, Franklin, (M.I.)	Winona, 1871, 74, 76, 77, 80.
Stinchfield, A. W.	Eyola.
Stone, A. J.	St. Paul, 1872.
Stone, J. J., (M.)	Wabasha, 1877.
Stuart, A. B.	Winona, 1870, 73, 75.
Thorne, William,	Hastings, 1870, 78.
*Willy, Samuel (?)	St. Paul, 1871 v.p. (d. 1872.)

MISSISSIPPI.

*Armstead, W. H.	Vaiden, 1875. (d. 1878.)
Barnett, James Richard,	Vicksburg, 1869. (d.)
Blanks, J. H.	Meriden, 1879.
Bondurant, Walter Ernest,	Natchez, 1869.
*Booth, David Winfield,	Vicksburg, 1869. (d. 1878.)

Brownrigg, John H.	Columbus, 1879.
Bryan, Thomas,	Pope, 1876.
Carter, W. D.	Ripley, 1879.
Cabaniss, Alfred Barwell,	Jackson, 1866, 69. (d. 1871.)
Cain, John S., (M.I.)	Okalona, 1857, 79.
*Compton, Wm. McCorkle,	Holly Springs, 1869, 75, 76, 77, 78. (d. 1878.)
Copes, J. S., (M.)	1846.
Craft, M. Sidney,	Jackson, 1869.
Cutler, Samuel Prentiss,	Holly Springs, 1869.
Dancy, Francis William,	Holly Springs, 1869.
Divine, Kinsman Clinton,	Canton, 1857, 69.
Ellis, A. J.	Sardis, 1879.
Ewing, C. C.	Aberdeen, 1879.
Featherston, John S.	Macon, 1879.
*Fenner, E. D.	1846. (d. 1866.)
Gadbury, William Young,	Yazoo City, 1869, 73, 74 V.P.
Galloway, Charles Betts,	Canton, 1869. (d.)
Grafton, Thomas J.	Rodney, 1854.
Grant, Harris A.	Watervalley, 1879.
Guice, Napoleon Lorenzo, (M.)	Fayette, 1869.
Hall, J. C.	McKinneysville, 1877.
Harrington, J. F.	Jackson, 1870. (d.)
Howard, B. E.	Durand, 1880.
Hughes, Edward William,	Granada, 1869, 75. (d.)
Inglehart, O. S.	Vicksburg, 1879.
Isom, Thomas Dudley,	Oxford, 1869.
Johnston, Wirt,	Jackson, 1875.
Keirn, G.	Lexington, 1847, 55.
Kells, Robert,	Jackson, 1869.
*Kinchaloe, D. A.	Sardis, 1875. (d. 1878.)
King, James Stebbins,	Natchez, 1869.
Kittrell, Benj. F.	Blackhawk, 1875.
Lowe, John T.	Aberdeen, 1857. (d.)
McArn, William Torry,	Union Church, 1869.
McConnell, J. D.	Brownsville, 1875.
Magoun, C. S.	1846.
Maxwell, P. J.	Columbus, 1875.
Moore, Jonas Patrick,	Yazoo City, 1869.
O'Leary, R.	Vicksburg, 1873.
Sale, E. Paul,	Aberdeen, 1879.
Semmes, Alphonso Thomas,	Canton, 1869.
Shattuck, J. W. M.	Columbus, 1873, 76.
Shufford, F. B.	Holly Springs, 1857.
Smith, George Washington,	Canton, 1869.
Smythe, A. G.	Baldwin, 1874, 75, 79.
Steinride, Joseph,	Benton, 1870, 73.
Taylor, J. M.	Corinth, 1873.
Taylor, W. A.	Boonville, 1879.
Vaughn, B. A.	Columbus, 1872, 75, 76, 77.
Ward, B. F.	Winona, 1879.
*Whitehead, P. F.	Vicksburg, 1875. (d.)
Williams, Wm. G.	Rodney, 1860.

MISSOURI.

Alexander, John B.	Lexington, 1854.
Allen, Geo. P.	St. Louis, 1873.
Allen, John M., (M.I.)	Prospect Hill, 1859, 78.
Alleyn, J. S. B.	St. Louis, 1854, 65.

Anderson, R. S.	St. Louis, 1873.
Anderson, Stephen W.	St. Louis, 1854.
Arnold, T. Allen,	Columbia, 1873.
Atchison, J. B.	St. Joseph, 1873.
Atkinson, J. F.	Lexington, 1854, 70.
Bannister, T. Y., (M.)	St. Louis, 1854.
Barker, Wm. S.	St. Louis, 1873, 77.
Barnes, A. F.	St. Louis, 1873, 77.
Barnes, John,	St. Louis, 1854.
Barnett, A. F., (M.I.)	1854.
Barret, Richard T.	St. Louis, 1854.
Bauduy, J. K.	St. Louis, 1873, 80.
Baumgarten, Frederick E.	St. Louis, 1854. (d. 1869.)
Baumgarten, Gustav,	St. Louis, 1873.
Behr, Alfred, (M.)	St. Louis, 1854.
Boisliniere, L. Charles,	St. Louis, 1854, 73.
Bottom, M.	Breckenridge, 1878.
Boulware, W. P., (M.)	1854.
Brennon, W. N.	St. Louis, 1873.
Brent, ——, (M.I.)	1854.
Briggs, Charles E.	St. Louis, 1873.
Brokaw, F. V. L.	St. Louis, 1873.
Broome, Geo. W.	Moberly, 1873.
Browne, R. H.	Kirksville, 1873.
Bryan, Joseph,	St. Louis, 1854.
Butler, Pierce N., (M.)	1854.
Campbell, G. W., (M.I.)	1854.
Cannon, J. W.	Jackson, 1877.
Carson, N. B.	St. Louis, 1873.
Castlehun, F. C.	St. Louis, 1871, 73. (d.)
Chandler, Charles Querlas,	Rockport, 1854.
Christopher, H., (M.I.)	1854.
Clark, J. J., (M.I.)	1854.
Clay, T. J.	St. Louis, 1874.
Coffee, T. J.	Steelville, 1878.
Conn, W. H., (M.I.)	1854.
Coons, A. J.	St. Louis, 1854.
Cooper, David M.	St. Louis, 1854.
Cooper, W. H.	St. Louis, 1873.
Curtman, Chas. O., (M.)	St. Louis, 1873.
Crary, C. W., (E.P.M.)	St. Louis, 1873.
Currey, Wm. A.	St. Louis, 1854.
Dalton, Robert H.	St. Louis, 1873.
Dean, D. V.	St. Louis, 1873, 80.
Delancy, J. O. F.	1880. (?)
Dewsy, Samuel J.	Breckinridge, 1873.
Dinmitt, J. P.	Clinton, 1873.
Dinmitt, Philo,	Shelbyville, 1873.
Donelson, E. A.	St. Joseph, 1873, 79.
Doyle, Thomas H.	St. Joseph, 1878.
Duncan, John H.	Columbia, 1878.
Dysart, B. G.	Paris, 1877, 79, 80.
*Edgar, Wm. S.	St. Louis, 1854, 73, 74, 75. (d. 1878.)
Engleman, Geo.	St. Louis, 1854, 73.
Engleman, Geo. J.	St. Louis, 1875, 77.
Essig, N. Fred.	Plattsburg, 1875, 78.
Evans, W. C.	Kansas City, 1873.
Evans, W. H.	Sedalia, 1880.
Faber, John E., (E.P.M.)	St. Louis, 1873.
Farrer, John O'Fallon, (M.)	1852, 54.
Flanner, Thomas U.	Springfield, 1873.

Foreman, J. M.	Jonesburg, 1873, 77.
Forsee, E. B.	St. Louis, 1875.
Frazor, E. S.	St. Louis, 1857, 59.
Freehan, Edward L.	St. Louis, 1873.
Geiger, Jacob,	St. Joseph, 1877, 78.
Gillett, J. S.	Carthage, 1880.
Glasgow, Wm. Carr,	St. Louis, 1875, 78, 79, 80.
Golding, Wm. S.	St. Louis, 1854, 71, 73.
Green, John,	St. Louis, 1873, 77.
Gregory, E. H	St. Louis, 1872, 73, 74, 75, 77.
Grissom, W. W., (M.)	St. Louis, 1870, 73.
Hall, J. Z.	St. Louis, 1867.
Hall, W. R.	St. Joseph, 1872.
Halley, George,	Kansas City, 1878, 80.
Hammer, Adam,	St. Louis, 1867, 70. (d. 1878.)
Hartt, George C.	Boonville, 1854.
Hazard, Wm. B.	St. Louis, 1873.
Hearne, J. C.	Hannibal, 1880.
Heddens, W. I.	St. Joseph, 1877.
Hempstead, Charles W., (M.)	St. Louis, 1853, 54.
Hodgen, John T.	St. Louis, 1867, 72, 73, 74, 75, 76, 77, 78, 80 P.
Holland, Thomas E.	St. Louis, 1880.
Holmes, R. S., (M.)	St. Louis, 1849, 54.
Homan, George, (M.I.)	St. Louis, 1879, 80.
Hopton, Abner, (M.)	St. Louis, 1854.
How, Cheney, (M.I.)	1847.
Hughes, C. H.	St. Louis, 1880.
Humphry, Wesley,	Mexico, 1873, 77, 78, 79.
Hurt, G.	St. Louis, 1873.
Hypes, B. M.	St. Louis, 1880.
Jamison, E. W.	St. Louis, 1880.
Jaudon, Benj. A.	Palmyra, 1873.
Jenkins, W. A., (M.)	1854.
Johnson, George,	St. Louis, 1854.
Johnson, John B.	St. Louis, 1847, 49, 50 V.P., 51, 53, 54, 60, 70, 71, 73, 74, 75.
Johnston, Wm.	St. Louis, 1873.
Judd, Homer,	St. Louis, 1869, 73.
Kennard, Thomas,	St. Louis, 1873, 75.
Kenny, John, (M.I.)	1854.
Kingsly, James P.	St. Louis, 1877, 78.
Knight, A. L., (M.I.)	1858.
Knight, C. F.	St. Joseph, 1873, 80.
Kneckelhan, A.	St. Louis, 1873.
Knode, Oliver B.	St. Joseph, 1860. (d.)
Laidley, L. H.	St. Louis, 1877.
Lankford, A. P.	St. Louis, 1870, 73, 74, 76, 77, 78, 79, 80.
Langton, John, (M.)	1854.
Leete, James M., (E.P.M.)	St. Louis, 1873, 77.
Lemoine, E. S.	St. Louis, 1853, 54, 55, 73.
Lenoir, W. T., (M.)	Jefferson, 1873.
Lester, Thos. B.	Kansas City, 1872, 73, 77, 78, 79, 80.
Levenworth, E. P.	St. Louis, 1854.
Lewis, R. K., (M.)	1854.
Linton, M. L.	St. Louis, 1854, 59, 66, 67.
Litton, A.	St. Louis, 1847, 54, 73.
Lorance, S. B., (M.I.)	1854.
Lucas, J. R.	Canton, 1873.
Ludwig, Charles V. F., (E.P.M.)	St. Louis, 1873.

Lumaghi, O., (M.I.)	1854.
McAlester, A. W.	Columbia, 1873.
McDowell, J. J.	St. Louis, 1867, 72, 73.
McDowell, Joseph N.	St. Louis, 1854, 59, 60. (d. 1868.)
McGintie, E., (M.I.)	1854.
McKeage, John M., (M.)	St. Louis, 1854.
McMurry, John H., (M.)	1854.
McPheeters, Wm. Marcellus,	St. Louis, 1850, 54, 58, 59, 69, 72, 73 v.p., 77.
Magoffin, John,	St. Louis, 1873.
Marsh, J. T.	Liberty, 1877, 78.
Marshall, Alexander, (M.)	1854.
Martin, M., (M.I.)	1854.
Massie, T. E.	St. Louis, 1855.
Maughs, G. M. B.	St. Louis, 1873, 80.
Maupin, W. L.	Columbia, 1873.
Mead, D. E.	St. Louis, 1847.
Mendenhall, T. J.	Palmyra, 1863.
Middlekamp, H. H.	Warrenton, 1873.
Miller, E. H.	Liberty, 1878.
Montgomery, Edward,	St. Louis, 1872, 73.
Moore, John Sidney,	St. Louis, 1852, 54, 57, 69, 70 v.p., 71, 72, 73, 75, 78.
Moses, Gratz A.	St. Louis, 1875, 77.
Moses, S. Gratz,	St. Louis, 1854, 73.
Mudd, Henry H.	St. Louis, 1873, 79.
Mullen, Alex. J.	St. Louis, 1875, 80.
Newman, S. T.	St. Louis, 1873.
O'Connor, A.	Pleasant Hill, 1880.
O'Reilly, P. S.	St. Louis, 1873.
Outten, W. B.	Carondelet, 1873.
Pallen, Montrose A.	St. Louis, 1858, 59, 60, 66, 67, 72, 73, 74.
*Pallen, M. M., (M.)	St. Louis, 1854. (d. 1875.)
Patton, J. M.	Gentryville, 1873, 77.
Penn, George, (M.)	St. Louis, 1854.
Perry, L. P.	St. Louis, 1854, 55.
Phillips, G. W.	St. Louis, 1864.
Pollak, S.	St. Louis, 1852, 54, 57, 73.
*Pope, Charles A.	St. Louis, 1846, 51, 52 v.p., 53, 54 p., 55, 57, 58, 59. (d. 1870.)
Porter, Frank G.	St. Louis, 1870, 73, 75.
Prewitt, T. F.	St. Louis, 1873.
Prout, H. A., (M.)	1854.
Renick, Oscar F.	Wellington, 1870.
Reyburn, Thomas,	St. Louis, 1848, 50, 51, 54. (d.)
Reynolds, J. W. B.	Port William, 1854.
Richmond, J. M.	St. Joseph, 1879.
Riess, Charles,	St. Louis, 1873.
Riley, A. A., (M.I.)	St. Louis, 1854.
Ritchie, Stephen,	Liberty, 1859.
Robinson, P. Gervais,	St. Louis, 1873, 77, 80.
Rucker, M. J., (M.)	1854.
Rumbold, Thomas F.	St. Louis, 1874, 75, 76, 78, 80.
Schauffler, E. W.	Kansas City, 1873, 80.
Scott, James M.	St. Louis, 1873, 75.
Shields, D. H., (M.I.)	Hannibal, 1880.
Shoemacker, Hammond,	Milwood, 1854.
Shore, John, (E.P.M.)	St. Louis, 1873.
Shumard, B. F.	St. Louis, 1867.
Simmons, Francis A., (M.)	St. Joseph, 1877.

Sloan, A. B.	Kansas City, 1879, 80.
Small, A. V.	Lexington, 1874.
Smith, Elsworth F.	St. Louis, 1855, 73.
Smith, J. D., (M.I.)	Fayette, 1854.
Smith, Robert E.	Savannah, 1873.
Spiegelhalter, Joseph,	St. Louis, 1873.
Steadman, J. G. W.	St. Louis, 1873.
Steel, A. J.	St. Louis, 1867, 70, 72, 73, 75, 77, 78, 79, 80.
Stevens, Charles W.	St. Louis, 1854.
Strothotte, A.	St. Louis, 1870.
Swallow, G. C., (M.I.)	Columbia, 1858.
Tandy, David C.	St. Louis, 1854.
Taylor, A. B.	Kansas City, 1873.
Tefft, Jonathan E.	Springfield, 1873.
Todd, Charles A.	St. Louis, 1873.
Todd, S. S.	Kansas City, 1873.
Torry, W. O.	Brookfield, 1873.
Trader, John W.	Sedalia, 1873, 77.
Vanzandt, Wm., (E.P.M.)	St. Louis, 1873.
Vaughan, Isaac P.	Glasgow, 1854.
Walker, George S.	St. Louis, 1854.
Walker, Jackson,	Bethany, 1873, 76.
Walters, John H.	St. Louis, 1859, 70.
Washington, James R.	St. Louis, 1853, 54, 58, 59.
Webb, William, (M.)	1854.
Welborn, John C., (M.)	Frankford, 1854. (d. 1857.)
Wesseler, F. W.	St. Louis, 1876, 77, 79.
Whitehill, Jas. C.	St. Louis, 1873.
Wilcox, ——, (M.I.)	1854.
Williams, W. C., (M.I.)	1854.
Wilson, John T.	Weston, 1873.
Wilson, J. W.	St. Louis, 1854.
Wislizenus, Adolphus,	St. Louis, 1854.
Wolf, Frederick, (M.I.)	Concordia, 18'6.
Woodson, J. B.	Kansas City, 1873, 80.
Woodson, J. C., (M.I.)	1854.
Wright, H. C., (M.I.)	1854
Yates, W. J.	Kearney, 1877.
Youngblood, J. M.	St. Louis, 1873.

NEBRASKA.

Anderson, M. T.	Omaha, 1874.
Black, John,	Platsmouth, 1871, 78.
Fuller, F. G.	Lincoln, 1876.
Hess, W. H.	Nebraska City, 1872.
Peabody, James H.	Omaha, 1870.
Van Buren, E.	Fremont, 1877.

NEW HAMPSHIRE.

Abbott, James B.	Sanbornton, 1848, 49, 53. (d. 1870.)
Adams, Daniel,	Manchester, 1878, 80.
Barney, John W.	Lancaster, 1865.
Bartlett, Ezra,	Exeter, 1849.
Bartlett, Josiah,	Stratham, 1847, 49, 53. (d. 1853.)
Batchelder, Daniel H.	Londonderry, 1849, 53.
Batcheller, James,	Marlborough, 1848, 49.

Bean, Luther C.	Lebanon, 1865.
Bickford, Alphonso,	Dover, 1865. (d. 1869.)
Blake, Jeremiah. (M.)	1852.
Boyden, Frederick,	Hinsdale, 1855, 60, 65. (d. 1872.)
Bradley, O. H , (E.P.M.)	E. Jeffrey, 1865.
Brown, H. B., (M.)	1853. (d. 1872.)
Brown, James F.	Chester, 1874.
Brown, Thomas,	Manchester, 1849. (d.)
Buck, William D.	Manchester, 1849, 65. (d. 1872.)
Burnham, Fred.	Bradford, 1880.
Call, Nathaniel,	Suncook, 1865. (d. 1875.)
Carr, Alonzo F.	Goffstown, 1849, 58, 60, 65, 74.
Carr, John,	Sanbornton, 1849. (d.)
Carter, Ezra,	Concord, 1849. (d. 1879.)
Carwell, N. DeW.	Manchester, 1880.
Chadbourn, Thomas, (M.)	Concord, 1849. (d. 1864.)
Childs, Wm.	Bath, 1872.
Conn, G. P.	Concord, 1880.
Crosby, Albert H.	Concord, 1878.
Crosby, Dixi,	Hanover, 1849, 53, 59, 60. (d. 1873.)
Crosby, George A.	Manchester, 1864, 76.
Crosby, Josiah,	Manchester, 1847, 49, 53, 55, 58 V.P., 59, 65. (d. 1875.)
*Crosby, Thomas R.	Hanover, 1849. (d. 1871.)
Cummings, Silas,	Fitzwilliam, 1849, 55, 60, 65.
Currie, Thomas H.	Enfield, 1856.
Danforth, James,	New Boston, 1849.
Davis, E. H.	Manchester, 1858, 60. (d. 1875.)
Davis, S. W.	Plymouth, 1880.
Dearborn, S. G.	Nashua, 1875, 76, 77.
Dickey, Abraham O.	Lyme, 1847. (d. 1873.)
Eastman, Josiah C.	Hampstead, 1849, 66.
Eaton, Harrison,	Merrimack, 1849, 58.
Evans, Earl,	Winchester, 1880.
Fernald, John S.	Dover, 1849. (d. 1862)
Fitch, E. P.	Amherst, 1858.
Fitch, Francis P.	Milford, 1847, 49. (d. 1874.)
Flanders, Daniel, (M.)	1848, 49.
French, John O.	Chesterfield, 1854.
French, Leonard,	Manchester, 1865.
French, Wm. F.	Papermill Valley, 1865.
Frost, C. P.	Hanover, 1880.
Gage, Charles P.	Concord, 1846, 48, 49.
Garland, G. W.	Meredith Bridge, 1853.
Gould, True M.	Raymond, 1865.
Gove, George S.	Whitefield, 1864.
Graves, Josiah G.	Nashville, 1848, 49.
Hamilton, Cyrus B.	Lyme, 1849. (d.)
Hammond, E. B., (M.)	Nashua, 1849.
Haynes, Timothy,	Concord, 1849.
Hill, Levi G.	Dover, 1849, 65, 76, 80.
Hoyt, Enos,	Farmingham, 1849. (d.)
Hubbard, George H.	Manchester, 1858, 60. (d.)
Hubbard, Oliver P.	Hanover, 1860.
Jarvis, Samuel G.	Claremont, 1864, 65.
Kelley, S. B., (X.)	Franklin, 1849. (d.)
King, R. H., (E.P.M.)	Wolfborough, 1865.
Knight, Luther M.	Franklin, 1853, 65.
Leslie, C. F.	Sunapee, 1880.
McIntire, Harvey G., (?)	Concord, 1866.
McNab, John,	Woodville, 1872. (d. 1877.)

McQuesten, Eugene F.	Nashua, 1873.
Manahan, Valentine,	Enfield, 1872.
Marshall, Thomas H.	Mason, 1849, 55, 64, 65. (d 1872.)
Martin, Noah,	Dover, 1849. (d. 1863.)
Mason, Wm. H. H., (M.)	Moultonborough, 1849.
Miller, Luke,	Fitzwilliam, 1856.
Moulton, Alvah, (M.)	Ossipee, 1853. (d.)
Parker, David T.	Farmington, 1855, 65.
Parker, Edward H., (M.)	1853.
Parker, John S.	Lebanon, Ill., 1880. (?)
Parsons, John W.	Portsmouth, 1870, 71, 75, 76,'80.
Pattee, W. H.	London, 1880.
Patton, J. L.	Whitefield, 1880.
Peabody, Leonard W.	Henniker, 1865.
Phelps, Edward E.	Dartmouth, 1847.
Phillips, B. H.	Pembroke, 1865.
Pierce, Hosa.	Winchester, 1856, 60.
Porter, Winslow B.	Papermill Valley, 1865.
Pray, T. J. W.	Dover, 1865.
Prescott, William,	Concord, 1849. (d. 1875.)
Richardson, A. P.	Marlow, 1865, 80.
Richardson, Samuel A.	Walpool, 1860.
Russell, Moses W.	Concord, 1876, 80.
Sanborn, Nathan,	Hennicker, 1850, 53. (d. 1858.)
Sanborn, Thomas,	Newport, 1858. (d. 1875.)
Sargent, J. F.	Concord, 1850, (d. 1865.)
Savory, Charles A.	Lowell, 1848, 49.
Shackford, Charles H.	Somersworth, 1860.
Smalley, Adomiram,	Lebanon, 1849, 53, 57. (d. 1876.)
Smith, Albert,	Peterborough, 1848, 49, 53, 64. (d. 1878.)
Smith, Joseph,	Lowell, 1849.
Spalding, Phineas,	Haverhill, 1860, 65.
Spaulding, Edward,	Nashua, 1849.
Stackpole, Paul A.	Dover, 1849, 65, 80.
Stickney, S. Smith, (M.)	Milford, 1849. (d.)
Stone, Wm. P.	Danbury, 1853. (d.)
Swett, John L.	Newport, 1864, 65, 71, 76.
Tenney, Richard P., (M.)	Pittsfield, 1846. (d. 1876.)
Thayer, Wm. Henry,	Keene, 1860.
Twitchell, Amos,	Keene, 1847, 49. (d. 1852.)
Twitchell, George B.	Keene, 1848, 60, 65, 68.
Wallace, Julia E.	Concord, 1880.
Warren, Moses R., (M.)	Rochester, 1865.
Webster, E. K.	Boscawen, 1849, 53.
West, John,	Manchester, 1878.
Wheeler, J. W.	Dover, 1872.
Wheeler, James H.	Dover, 1873, 80.
Wheeler, Phineas H., (M.)	Alton, 1865.
Whitmore, Jacob P.	Chester, 1858, 65.
Willard, M. T., (M.)	Concord, 1849.
Woodbury, M. R., (M.)	1849.
Woodbury, Peter P.	Bedford, 1848. (d.)

NEW JERSEY.

*Abernethy, Samuel, (M.)	Rahway, 1870. (d. 1874.)
Anderson, C.	Madison, 1880.
Andress, T. H.	Sparta, 1876.
Arrowsmith, J. E.	Keyport, 1864, 80.

Avery, A. G.	Jersey City, 1872.
Ayres, D. S.	Rockaway, 1880.
Baldwin, Henry R.	New Brunswick, 1864, 80.
Ballery, G. N.	Paterson, 1880
Barker, Phanett C.	Morristown, 1880.
Bateman, B. Rush,	Cedarville, 1853.
Bateman, Eli E.	Fairton, 1860.
Bateman, Ephraim,	Cedarville, 1858, 60.
Bayles, G. B., (M.I.)	Orange, 1880.
Blane, John,	Perryville, 1855, 56, 58, 60, 63, 64, 65, 66, 72.
Boilean, Nathan B.	Everettstown, 1864.
Boucher, James H.	Newark, 1860.
Brakeley, P. F.	Belvidere, 1853, 55, 60, 72, 76.
Briggs, J. Solon, (M.I.)	Newark, 1880.
Briggs, Mrs. J. S., (M.I.)	Newark, 1880.
Brinnley, John D.	Newark, 1866.
Brown, Richard E.	Mount Holly, 1870.
Buckingham, Henry G.	Clayton, 1876, 78.
Budd, A. E., (M.)	Mount Holly, 1853, 72.
Burlingham, H. D.	Plainfield, 1876.
Butcher, Charles,	Mauricetown, 1853.
Butler, S. W.	Burlington, 1853, 55, 57, 58. (d. 1874.)
Canfield, I. W.	Morristown, 1849, 53. (d.)
*Cattell, Samuel G.	Deerfield, 1866. 68, 72. (d. 1877.)
Carpenter, A. E.	Boonton, 1876, 80.
Chabert, Romeo F.	Hoboken, 1864.
Chandler, W. J.	S. Orange, 1880.
Cheetwood, G. R.	Elizabethtown, 1852, 53, 54, 55.
*Clark, Charles F.	Woodbury, 1855. (d. 1875.)
Clark, H. C.	Woodbury, 1858.
*Clark, J. Henry,	Newark, 1851, 53, 58. (d. 1869.)
Clark, Samuel S.	Belvidere, 1866, 67, 80.
Clawson, Isaiah D., (M.I.)	Clayton, 1858.
Clendenin, A.	Orange, 1880.
Cole, N. W.	Burlington, 1847. (d.)
*Coleman, Isaac P.	Pemberton, 1855, 58. (d. 1869.)
*Coleman, James B.	Trenton, 1855. (d. 1877.)
Coles, Abraham,	Newark. 1859, 64, 80.
Coles, J. A.	Scotch Plains, 1876, 80.
*Condict, Lewis,	Morristown, 1853 v. p., 55, 56. (d. 1862.)
Conover, Robert R.	Red Bank, 1864.
*Cook, Charles,	Jersey City, 1853, 55. (d. 1867.)
Cooke, John,	Englishtown, 1864.
*Cooper, Richard M.	Camden, 1847, 49, 50, 51, 52, 54, 55, 57, 70. (d. 1874.)
*Cornelison, J. M., (M.)	Jersey City, 1853. (d. 1875.)
Corson, Thomas J.	Trenton, 1855. (d. 1879.)
Corwin, J. Albert,	Newark, 1864.
Coursen, W: S.	Newfoundland, 1865.
*Craig, John W.	Plainfield, 1853. (d. 1871.)
Cramer, Isaac S.	Sergeantsville, 1863, 66, 67, 68, 80.
Crane, Job S.	Elizabeth. 1871, 72.
Cullen, Thomas F.	Camden, 1856, 72. (d. 1877.)
Currie, D. A.	Englewood, 1876, 80.
*Dayton, Alfred B.	Camden, 1858, 60, 64. (d. 1870.)
Dean, Charles C.	Camden, 1864.
Deshler, Charles F.	Hightstown, 1874. (d. 1879.)

Dickenson, G. K.	Jersey City, 1880.
Disbrow, S. M.	Howell, 1860, 64.
Dougherty, Alexander N.	Newark, 1853, 59, 60, 80.
Elmer, Henry W.	Trenton, 1874.
Elmer, Robert W.	Bridgeton, 1872.
Elmer, William,	Bridgeton, 1850, 51, 52, 55, 58, 60, 64, 65, 66, 68, 71, 72, 76, 77, 80.
English, D. C.	New Brunswick, 1876, 77, 79, 80.
English, J. S.	Manalapan, 1860, 64.
Fisher, W. R.	Hoboken, 1880.
Fisler, Samuel P.	Clayton, 1870, 72, 73. (d. 1875.)
Fitch, Geo. D.	Hope, 1864.
Fithian, Enoch,	Greenwich, 1849, 50, 51, 52, 55, 58, 59.
Fithian, Joseph,	Woodbury, 1848, 49, 51, 59.
Flagler, Thomas B.	Morristown, 1875, 76, 77.
Foreman, S. R	Jersey City, 1876.
Forman, D. McLean,	Freehold, 1880.
*Garrison, Charles,	Swedesboro, 1849. (d. 1875.)
Garrison, Joseph F.	Swedesboro, 1847.
Gauntt, Franklin,	Burlington, 1853, 67, 72, 76, 80.
Gibbon, Quinton,	Salem, 1847, 48, 55.
Gilbert Rufus,	Elizabethtown, 1866, 67.
Grant, Gabriel,	Newark, 1858, 60, 66, 67, 68.
Grant, Geo.	Newark, 1865.
*Gray, J. Alfred,	Flemington, 1864. (d. 1872.)
Goodell, George,	Plattsburg, 1855, 58, 60, 64, 65, 66, 72.
Gordon, L. J.	Jersey City, 1876.
*Green, Henry Prentice, (M.	Madison, 1849. (d.)
Green, James S.	Elizabeth, 1872, 80.
Grimes, John, (M.)	Boonton, 1853.
Gross, Onan B.	Camden, 1880.
Haines, Jacob,	Burlington, 1848.
Hampton, Isaac H.	Burlington, 1855. (d.)
Hart, Charles A.	Plainfield, 1880.
*Hasbrouck, Charles,	Hackensack, 1866. (d. 1877.)
Havens, Jonathan,	Dickerton, 1865, 68.
*Henry, Charles D.	Camden, 1849. (d. 1869.)
Heretage, J. Down,	Glassboro, 1880.
*Hodge, Charles,	Trenton, 1872. (d. 1876.)
Holden, Edgar,	Newark, 1866, 72.
Hopper, H. A.	Hackensack, 1880.
Hunt, Ezra M., (M.I.)	Metuchen, 1864, 65, 66, 68, 70, 76, 77, 80 V.P.
Hunt, Thomas Edgar,	Clarksville, 1848, 49.
James, H. H.	Rahway, 1874.
Janeway, John H.	Princeton, 1858.
Jennings, N. B.	Haddonfield, 1876. 80.
*Job, Eugene,	Springfield, 1858, 60, 66. (d. 1875.)
*Johnes, John B.	Morristown, 1853. (d. 1863.)
Johnson, John C.	Blairstown, 1860.
Kinch, F. A., (M.)	Westfield, 1872.
Kipp, Charles, J.	Newark, 1872, 80.
Leal, J. R.	Paterson, 1880.
*Lilly, Samuel,	Lambertville, 1853, 66, 67, 68, 70, 72, 73, 74, 75, 76 V.P., 77, 78, 79. (d. 1880)
*Linn, Alexander, (M.)	Deckerton, 1853. (d. 1868.)
Long, Isaac S.	Englishtown, 1872.
Longstreet, Henry H.	Bordentown, 1855, 72.
McGill, John D.	Jersey City, 1872, 80.
Magee, John,	Paterson, 1848.

Marcy, Alexander,	Camden, 1876.
Marsh, E. J.	Paterson, 1846, 47, 72.
*Martin, Samuel K.	Martinville, 1856. (d. 1868.)
Merrill, S. R.	Paterson, 1872.
Miller, John,	Andover, 1874, 76, 80.
Miller, Samuel T.	Paulsboro, 1873.
Mitchell, Henry,	Jersey City, 1872.
Moore, Charles V.	Stillwater, 1858, 60, 65, 70.
Morford, Anthony D.	Newton, 1853, 55.
Morgan, James F. (M.)	1873.
Morris, Thomas F.	Jersey City, 1876.
*Mulford, Isaac S	Camden, 1855. (d. 1873.)
*Munn, Jeptha B.	Chatham, 1849, 53, 55. (d. 1863.)
Myers, Charles F. W.	Paterson, 1876, 80.
Nelden, Charles R.	Newton, 1868.
Nicholas, Whitfield,	Newark, 1849. (d.)
Oakley, L. W.	Elizabeth. 1858, 80.
Owen, Fred Wooster,	Morristown, 1878.
Page, R. H.	Columbus, 1858, 72.
Parrish, Joseph,	Burlington, 1847, 52, 76.
Paul, J. M.	Belvidere, 1880.
Pennington, Samuel H.	Newark, 1848, 49, 51, 53, 64, 65, 80.
Personett, Stephen,	Verona, 1876.
Phillips, John H.	Pennington, 1853, 55. (d. 1878.)
Pierson, Stephen,	Morristown, 1879.
Pierson, William,	Orange, 1847, 53.
Pierson, William, Jr.,	Orange, 1856, 58, 60, 63, 66, 76, 80.
Porter, E. M.	Bridgeton, 1852.
Petit, Alonzo,	Elizabeth, 1872, 80.
Pinkham, J. W.	Mt. Clair, 1880.
Quimby, Isaac N.	Jersey City, 1872, 74, 76, 77, 78, 79, 80.
Read, Zacharia,	Mount Holly, 1847, 55. (d. 1879.)
Ribble, W. B.	Millstown, 1864.
*Robbins, George R., (M.I.)	Hamilton Square, 1858. (d. 1875.)
Ryers, Alexander W.	Paterson, 1849, 53, 58, 80.
Ryerson, John G.	Boonton, 1874, 80.
Ryerson, Thomas,	Newton, 1864.
Saunders, Thomas J.	Woodbury, 1848, 50, 52.
*Sayre, David M.	Newton, 1860, 63, 65, 70, 71, 74, 76. (1876.)
*Schenck, Fred S.	Six Mile Run, 1847, 54. (d. 1860.)
Schenck, J. V.	Camden, 1858, 72, 76.
Schievely, Geo. S., (M.)	Burlington, 1858.
Schumo, Eugene, (M.)	Laytons, 1876.
Sharp, Lewis L.	Medford, 1873.
Sickler, John R.	Mantua, 1855, 58, 60, 68, 70, 72.
Skelton, Charles,	Trenton, 1876. (d. 1879.)
Skinner, Daniel M., (M.)	Belleville, 1877, 80.
Smith, D. W.	Newark, 1876, 80.
Smith, Henry,	Neshanie, 1860.
Smith, Lynden, A.	Newark, 1846, 47, 50, 53, 54, 55, 56, 58, 59 V.P., 60, 64, 56. (d. 1865.)
Smith, T. J.	Bridgeton, 1880.
Snowden, John W.	Waterford, 1872, 76, 80.
Southerd, Lott,	Newark, 1864, 76, 78, 80.
Stiger, John S.	Mendham, 1876.
Stillman, Chas. F.	Plainfield, 1876, 80.
Stokes, N. Newlin,	Morristown, 1876.
*Stratton, Benj. H.	Mount Holly, 1852, 55, 58, 60. (d. 1875.)
*Stuart, John R.	Newton, 1855, 60. (d. 1873.)

*Studdiford, Jas. Henry,	Lambertville, 1866. (d. 1870.)
Studdiford, T. H.	Lambertville, 1870.
Sullivan, Geo. R.	Flemington, 1872.
Taylor, Edward,	Middletown. 1864.
Taylor, H. Genet,	Camden, 1870, 73, 76.
*Taylor, Othneil H.	Camden, 1847, 48, 53, 55, 58. (d. 1869.)
Terviberry, G. W.	Paterson, 1872.
Thomas, Chas. Herman, (M.)	Philadelphia, Pa., 1877.
Thomason, T. J.	Perryville, 1860, 64, 68, 72, 74, 76, 78.
Thomson, John,	Hoboken, 1855.
*Thornton, Samuel C.	Moorestown, 1872, 73. (d. 1858.)
Tichenor, H. H.	Newark, 1880.
Tomlinson, Geo.	Roadstown, 1865.
Townsend, E. P.	Beverly, 1872.
Turner, W. H., (M.)	Mantua, 1876. (d. 1876.)
Van Dyke, Rush,	New Brunswick, 1876.
Van Matter, D. G.	Columbus, 1880.
Varick, Theodore R.	Jersey City, 1853, 64, 80.
Voorhees, A. F., (M.)	Baskinridge, 1853.
Voorhees, Charles H.	New Brunswick, 1876.
Vought, John,	Freehold, 1876, 80.
*Ward, John F., (M.)	Newark, 1853. (d. 1873.)
Watson, B. A.	Jersey City, 1872, 78, 79, 80.
Welch, George T.	Keyport, 1876.
Whitaker, J. S.	Millville, 1880.
White, J. Orlando,	Camden, 1872.
Whitehead, W. M.	Elizabeth. 1870.
Whittingham, Edward T.	Milburn, 1860.
Wicks, Stephen.	Orange, 1864.
Williamson, Nicholas.	New Brunswick, 1880.
Woodhull, Addison W.	Newark, 1860, 72.
Woodruff, A. D.	Haddonfield, 1855, 58.

NEW YORK.

Abbott, Frank M , (M.I.)	Buffalo, 1878.
Abbott, George, (M.I.)	White's Corners, 1878.
Acosta, E.	New York, 1858.
*Adams, Hiram,	Fabius, 1860, 64. (d. 1865.)
Adams, John G.	New York, 1847, 48, 49, 50, 51, 52, 53, 58, 64, 80.
Agnew, Cornelius R.	New York, 1860, 64, 72, 76, 80.
Aigner, Godfrey,	New York, 1864.
Ainsworth, H. R.	Addison, 1879, 80.
Alba, E. M.	Angelica, 1864.
Allen, Henry B.	Baldwinsville, 1880.
Allen, Jabez, (M.I.)	Aurora, 1878.
Allen, Lucius H.	Owego, 1853, 60, 64.
Allen, R. L.	Saratoga Springs, 1854, 64. (d. 1873.)
Alley, W. B.	Nunda, 1878.
Allin, Charles M.	Flushing, 1860, 64, 76.
Ames, E.	Sherman, 1880.
Ames, L. J.	Mount Morris, 1878.
Anderson, James,	New York, 1849, 53, 64, 65, 66, 67.
Anderson, James H.	New York, 1880.
Anderson, W. C.	Stapleton, 1855, 56, 58, 59, 64, 72.
Andrews, John S.	Brooklyn, 1878, 80.
Appley, W. L.	Coshocton, 1872. (d. 1877.)
Armor, Samuel G.	Brooklyn, 1872, 80.

*Armsby, James H.	Albany, 1853, 64, 65, 68, 71, 72. (d. 1875.)
Armstrong, E. W.	Rochester, 1855.
Arnold, Edmond S. F.	Yonkers, 1863, 64, 66, 70.
Arnold, John H., (M.)	1853.
Atwater, David F.	Brooklyn, 1847, 53.
Austin, James M.	Waterford, 1853, 55.
Ayer, W. L.	Owego, 1878, 80.
Ayres, Daniel,	Amsterdam, 1846, 47, 53. (d. 1853.)
Ayres, Daniel, Jr., (?)	Brooklyn, 1847.
Babcock, Charles,	New Hartford, 1849.
Babcock, H. D.	Buffalo, 1871.
Bacon, Charles Giles,	Fulton, 1855, 60, 64.
Bahan, Thomas S.	New York, 1865, 68.
Bailey, Wm. H.	Albany, 1870, 80.
Baker, A., Jr.,	Norwich, 1849, 55. (d. 1864.)
Baker, C. O.	Elbridge, 1878, 80.
Baker, Geo. W.	Brooklyn, 1876, 80.
Baker, Milan, (M.I.)	Warsaw, 1878.
Baker, Smith,	Westchester, 1880.
Ball, John,	Brooklyn, 1853, 58.
Bangs, L. Bolton,	New York, 1880.
Bangs, Richard T., (M.I.)	New York, 1880.
Banks, James L.	New York, 1864, 65, 66, 67, 68, 76, 80.
Barber, Isaac H.	Brooklyn, 1880.
Barker, Arthur M., (M.I.)	Buffalo, 1878.
Barker, Fordyce,	New York, 1851, 53, 55, 64, 70, 80.
Barnes, Edwin R.	Buffalo, 1877, 78.
Barnes, Enos,	Geneva, 1847, 48.
Barnett, C. V.	Windham Centre, 1863, 71.
Barrett, S.	Le Roy, 1856.
Barrows, Charles,	Clinton, 1860. (d. 1870.)
Barry, Robert A.	New York, 1865, 76, 80.
Bartles, O. S.	New York, 1846.
Bartlett, C. H.	Olean, 1878.
Bartlett, F. W., (M.I.)	Buffalo, 1878.
Bartlett, H. E., (M.I.)	1853.
Bartlett, Homer Lyman,	Flatbush, 1858, 60, 64, 65, 80.
Barton, Bernard,	Buffalo, 1878.
Barton, P. H., (M.I.)	New York, 1864.
*Batchelder, John P.	New York, 1849, 53, 55, 58, 60. (d. 1868.)
Bates, Erskin S.	New York, 1880.
Bates, Joseph, (M.)	New Lebanon Springs, 1868. (d. 1879.)
Bates, X. T., (M.I.)	New York, 1868.
Bauer, Louis,	Brooklyn, 1855.
Baxter, Hiram,	Stillwater, 1849. (d. 1865.)
Bay, William,	Albany, 1853. (d. 1865.)
Beadle, Edward L.	Poughkeepsie, 1846, 48, 52, 53, 58, 64.
Beale, E. J.	New York, 1848.
Beard, George M.	Brooklyn, 1872, 74, 80.
Beardsly, Levi,	Oneida, 1878. (d.)
Beardsly, Wm. H.	Coventry, 1853, 58, 64. (d.)
Beasly, John M., (M.)	1878.
Battie, Joseph,	Geneva, 1860.
Beck, John B., (M.)	New York, 1846. (d. 1851.)
Beck, T. Romeyn,	Albany, 1846, 52. (d. 1855.)
Beebe, Seneca,	Maraltown, 1853.
Beicher, H. H.	North Norwich, 1858. (d.)
Beisell, E. L., (M.I.)	Buffalo, 1878.

Bell, A. Nelson,	Brooklyn, 1860, 64, 66, 70, 73, 74, 75, 76, 77, 78, 79, 80.
Bellows, H. Knight,	Norwich, 1871. (d. 1880.)
Bennett, H. F.	Canandaigua, 1878, 80.
Bennett, Surge H.	Lima, 1874, 76, 77, 78, 80.
Benton, John B.	Spencer, 1860.
Bibbins, William B.	New York, 1864, 65, 66, 67, 68. (d. 1871.)
Bigelow, A. G., (M.I.)	1853.
Bigelow, John M.	Albany, 1880.
Billington, C. E.	New York, 1878, 80.
Binkerhoff, T. S.	Auburn, 1868.
Birchard, Wm. Hunter,	New York, 1865, 66.
Birckhead, W. H., (M.)	New York, 1865.
Birdsall, Gilbert,	N. Brookfield, 1880.
Birdsall, W. R., (M.I.)	New York, 1880.
Bissell, Daniel H.	Geneva, 1874.
*Bissell, D. P., (E.P.M.)	Utica, 1849, 56, 58, 63, 64, 65, 66, 70. (d. 1874.)
*Blair, Arba,	Rome, 1860. (d. 1863.)
Blake, Z. H.	Dansville, 1876. 78.
Blakeman, Wm. N.	New York, 1847, 53, 55, 58, 60, 63, 64, 66, 80.
Blatchford, Thomas W.	Troy, 1846, 47, 49, 50, 52, 53, 54, 56 V.P., 59, 60, 64. (d. 1865.)
Blawis, Reuben,	Fort Miller, 1864. (d. 1872.)
Bliss, Charles, (M.I.)	New York, 1880.
Bliss, James C., (M.)	New York, 1853.
Blodgett, Julius, (M.)	New York, 1860.
Blumenthal, Mark,	New York, 1864, 80.
Bly, Douglass,	Rochester, 1859 60, 64, 65. (d. 1876.)
Bodkin, D. G.	Brooklyn, 1876, 80.
Bordman, John, (M.I.)	Buffalo, 1878.
Bogert, S. F. R.	New York, 1853.
Boils, L. F., (M.I.)	East Hamburg, 1878.
Boland, H. A.	Lawrenceville, 1874.
*Bolton, Jackson,	New York, 1853, 58. (d. 1866.)
Bontecon, Reed B.	Troy, 1853, 58, 70, 72, 74, 75, 76, 78, 80.
Borrowe, Jacob H.	New York, 1849, 53.
Bosworth, F. H., (M.I.)	New York, 1880.
Bosworth, Frank H.	New York, 1880.
Bottom, E. W.	Lyons, 1874, 78, 80.
Bourne, C. W., (M.I.)	Boston, 1878.
Boyd, Jas. P., Jr.,	Albany, 1880.
Boysen, T. H., (M.I.)	Buffalo, 1878.
Bozeman, Nathan,	New York, 1868, 70, 72, 77, 80.
Bradford, Geo. W.	Homer, 1847, 50.
Bradner, N. Roe,	Warwick, 1867, 68, 80.
Brady, John A.	Brooklyn, 1856, 58, 70, 75. (d. 1877.)
Brady, Robert A., (M.)	New York, 1872.
Brecht, L. F. E., (M.I.)	Buffalo, 1878.
Breed, Daniel, (M.)	1849.
Bridges, Elisha H.	Ogdensburg, 1876, 78.
Bridges, Z. B.	Ogdensburg, 1880.
Briggs, A. H., (M.I.)	Buffalo, 1878.
Briggs, John, (M.)	1865.
Briggs, W. H.	Rochester, 1856, 60.
*Brinsmade, Thomas C.	Troy, 1848, 49, 52, 53, 56, 58, 60, 63, 64, 65, 66 V.P., 68. (d. 1868.)
Bronson, Edward Bennett,	New York, 1880.
Bronson, John O.	New York, 1866.

Brooks, Daniel,	Brooklyn, 1860.
Brooks, Pelatiah B.	Binghamton, 1853, 55. (d. 1874.)
Brown, H. Weeks,	New York, 1855.
Browne, J. W.	Mottsville, 1880.
Brown, James L.	New York, 1864.
Brown, W. H.	Syracuse, 1880.
*Brownell, Russell B.	New York, 1864. (d. 1867.)
Brush, E. N.	Buffalo, 1874, 78.
Brush, Geo. R., (M.I.)	New York, 1864.
Brush, H. M.	New York, 1864.
Bryant, John D.	New York, 1880.
Buck, A. H., (M.I.)	New York, 1872, 80.
Buck, Gurdon,	New York, 1846, 48, 53, 64, 68, 70, 72. (d. 1877.)
Buckley, John J.	Delhi, 1880.
Bucklin, Daniel D.	Lansingburg, 1870, 72.
Budd, Charles A.	New York, 1858, 64, 65.
Budlong, Caleb,	Frankford, 1853, 54. (d. 1865.)
Buell, Richard M.	Brooklyn, 1864, 65.
Buell, William P.	New York, 1846, 49, 53.
Bulkley, Henry D.	New York, 1846, 47, 49, 53, 55, 58, 60, 64, 65, 70. (d. 1872.)
Bulkley, L. Duncan,	New York, 1874, 75, 76, 77, 79, 80.
Bull, Charles S.	New York, 1873, 80.
Bullard, W. E.	New York, 1880.
Bumstead, Freeman J.	New York, 1865. (d. 1880.)
Bunker, E. S.	New York, 1880.
Burchard, Thomas Herring,	New York, 1880.
Burdick, Francis,	Johnston, 1865, 72. (d. 1877.)
Burge, J. H. Hobert,	Brooklyn, 1858, 60, 64, 66, 70, 72, 76, 80.
Burk, John,	New York, 1868.
Burr, George,	Binghamton, 1865, 69.
Burr, W. J.	Newark Valley, 1878.
Burrell, D. R.	New York, 1880.
Burrell, Fred. A.	New York, 1872, 80.
*Burton, C. V. W.	Lansingburg, 1849. (d. 1860.)
Burton, Matthew Henry,	Troy, 1869, 70, 72, 76, 79, 80.
Burton, Thompson,	Fultonville, 1880.
Burwell, Bryant,	Buffalo, 1846, 47. (d. 1861.)
Burwell, George N., (M.I.)	Buffalo, 1850, 51, 53, 57, 78.
Butler, William C., (M.I.)	1853.
Butler, Wm. C.	Livingston, 1853.
Butterford, G. S.	1846.
Bryan, John,	Brooklyn, 1864, 66, 70, 75, 76, 80.
Cady, Geo. P.	Nicholas, 1878, 80.
Calkins, Alonzo,	New York, 1849.
*Cammann, G. P.	New York, 1853. (d. 1863.)
Campbell, A. M.	Mt. Vernon, 1880.
Campbell, Geo. T.	Skaneateles, 1874, 76, 78, 80.
Campbell, John L., (M.I.)	New York, 1880.
Campbell, R. E., (M.I.)	Buffalo, 1878.
Carmalt, Wm. H.	New York, 1864, 70.
Carnochan, J. Murray, (M.)	New York, 1852, 53.
Caro, Salvator,	New York, 1872, 80.
Carpenter, Elijah W.	Brooklyn, 1872.
*Carr, Edson,	Canandaigua, 1848, 49, 51, 53, 55, 58. (d. 1861.)
Carr, James E.	Jordan, 1878.
Carrington, Henry A.	Lansingburg, 1864.
Carroll, A. Lee,	New Brighton, 1880.

Carroll, O. A.	Port Jarvis, 1867, 72.
*Carter, Galen,	New York, 1853, 64. (d. 1870.)
Caruthers, Horace,	Tarrytown, 1880.
Cary, Charles, (M.I.)	Buffalo, 1878.
Cary, Walter,	Buffalo, 1848, 58.
Case, Jonathan H.	Albany, 1853, 60.
Casey, James E.	Mohawk, 1860, 64.
Casey, S. H., (M.I.)	Oneonta, 1864.
*Cash, Merrit H.	Ridgebury, 1846, 52, 53. (d. 1861.)
Castle, F. A., (M.I.)	New York, 1880.
Chase, W. B. (M.I.)	New York, 1880.
Chase, Wm.,	Mayville, 1876, 80.
Chalmers, Thomas,	New York, 1846.
Chamberlain, Wm. H., (M.I.)	New York, 1880.
Chamberlain, W. M.	New York, 1870.
Chamberlayne, J. K.	Cazenova, 1856, 65, 66, 68, 80.
Chapin, J. B.	Ovid, 1872.
Chapman, E. N.	Brooklyn, 1860, 64, 80.
Chapman, J. F.	Ketonah, 1872, 80.
Cheeney, E. W.	Canandaigua, 1863.
*Cheeseman, John C.	New York, 1846, 53. (d. 1862.)
Cheeseman, T. M.	New York, 1872, 76.
*Childs, Timothy,	New York, 1864. (d. 1865.)
Chittenden, J. H.	Binghamton, 1878.
Chubbuck, H. S.	Elmira, 1853, 65, 74.
Church, Allen S., (M.I.)	New York, 1877, 80.
*Church, Wm. H.	New York, 1853. (d. 1866.)
Cisneros, Juan,	1880.
Clark, A. Bryant,	Brooklyn, 1864.
Clark, Alonzo,	New York, 1855, 64.
Clark, C. C. P.	Oswego, 1870.
*Clark, Darius,	Canton, 1846. (d. 1870.)
Clark, C. F.	Brooklyn, 1876, 80.
Clark, H. K., (M.I.)	Geneva, 1878.
Clark, Joseph E.	Brooklyn, 1870.
Clark, Simeon Tucker, (M.)	New York, 1878.
Clark, Wallace,	Utica, 1878.
Clements, B. A.	New York, 1864.
Clements, James W. G.	Brooklyn, 1849, 53, 64.
Cleveland, Clement,	New York, 1880.
Cleveland, J. M.	Utica, 1860.
Clymer, M., (M.I.)	New York, 1880.
Cobb, J. Vaughn,	Rome, 1856, 60, 64, 65, 72. (d. 1877.)
Coe, A. B.	Oswego, 1853. (d. 1854.)
*Cock, Thomas, (M.I.)	New York, 1846, 47, 53, 55, 64. (d. 1869.)
Cock, Thomas F.	New York, 1848, 53, 55, 80.
Cockcroft, James,	New York, 1853. (d.)
Colburn, Jas. E.	Canton, 1880.
Cole, P. C., (M.I.)	New York, 1880.
Coles, Levant B.	Batavia, 1865.
Collins, Clarkson T.	New York, 1849.
Colt, E. N.	Brooklyn, 1864.
Colt, J.	Batavia, 1858.
Colton, F. H.	Brooklyn, 1872.
Colvin, Darwin,	Clyde, 1864, 78, 80.
*Conant, D. S.	New York, 1855, 65. (d. 1865.)
Cone, Robert C.	Lowville, 1860. (d. 1879.)
Conger, H. M.	Buffalo, 1850.
Connery, E. D., (M.I.)	New York, 1870.
Connolly, Jas. J.	New York, 1864, 65. (d. 1871.)

Cook, Geo. W.	Syracuse, 1880.
Cooke, Simeon,	Buskirk's Bridge, 1847.
*Cooper, James S.	New York, 1853, 64. (d. 1867.)
Cooper, Wm. S.	Troy, 1880.
Corliss, Hiram,	Greenwich, 1847, 58, 60, 64, 65, 68, 72. (d. 1877.)
Corson, John W.	New York, 1853, 55.
Cotes, John,	Batavia, 1846, 48. (d. 1859.)
Cotes, John R.	Batavia, 1878.
Cotes, L. B.	Batavia, 1856, 58, 63.
*Coventry, Charles B.	Utica, 1849, 52, 53, 56, 58, 64. (d. 1875.)
*Cox, Henry G.	New York, 1853. (d. 1866.)
Crafts, E. G.	Binghamton, 1864.
Craig, James W.	Churchville, 1878.
Crandall, C. Milford,	Belfast, 1864. (d. 1867.)
Crandall, H. S.	Leonardsville, 1880.
Crandall, R. O.	Waverly, 1853, 55.
Crane, James,	Brooklyn, 1858.
Crane, Jas. S.	New York, 1864.
Crane, J. Mortimer,	Watertown, 1878.
Crawford, S. M.	Owego Co., 1846.
Crispell, Abm.	Rondout, 1860, 68.
Critenden, A. G.	Clifton Springs, 1864.
Cronyn, John,	Buffalo, 1878, 80.
Crosby, A. B.	Brooklyn, 1872.
Curry, Jas. Hart,	Shrub Oak, 1860, 64, 65, 68.
*Curtis, E. M.	Oswego, 1871. (d. 1874.)
Curtis, R. J., (M.I.)	Angolia, 1878.
Curtis, W. H., (M.I.)	Angolia, 1878.
Dagenais, A., (M.I.)	Buffalo, 1878.
Daggett, B. H., (M.I.)	Buffalo, 1878.
Dallas, Alexander J.	Camillus, 1864, 76, 78, 80.
Dalton, John C., Jr.,	New York, 1853, 58, 65.
Dambach, John, (M.I.)	Buffalo, 1878.
Dana, Samuel W.	New York, 1860.
Daniels, E.	Union, 1856.
Darby, John T.	New York, 1876, 78.
Davidson, A. R.	Buffalo, 1880.
Davis, E. H.	New York, 1853, 54, 55, 64.
Davis, Henry G.	New York, 1863.
Davis, Lymon H., (M.)	Cortland Co., 1850.
Davis, N. S.	New York, 1846, 47, 49.
Dawson, Benj. Frederick, (M.I.)	New York, 1869, 70, 71, 72, 80.
Dayton, C. L., (M.I.)	Buffalo, 1878.
Dayton, L. P. (M.I.)	Buffalo, 1878.
Dean, Henry W.	Rochester, 1855, 58, 60, 65, 68, 72, 73, 75, 76, 77. (d. 1878.)
Dearborn, S. G. (?)	Nashua, N. H., 1880.
De Garmo, W. B.	New York, 1880.
Delafield, Edward,	New York, 1846 V.P., 53, 58, 64.
Delano, B. L.	Lockport, 1863, 64, 65, 66, 67, 68.
Deming, J. P. H.	Palmyra, 1855, 60, 64.
Denman, J. D.	Scottsville, 1878. (d. 1879.)
Dennis, F. S., (M.I.)	New York, 1880.
*Dering, Nicoll H.	Utica, 1849, 52, 55, 60. (d. 1867.)
Dessau, S. H., (M.I.)	New York, 1880.
De Szigathy, Chas. A. H.	Brooklyn, 1877.
Detmold, William,	New York, 1853.
Detmold, W., Jr.,	New York, 1858.
Devendorf, D. B., (M.)	Herkimer, 1853.
Devening, Daniel, (M.I.)	Buffalo, 1878.

De Witt, Byron.	Oswego, 1876, 78.
Didama, Henry D.	Syracuse, 1864, 72, 74, 75 V.P., 76, 78, 79, 80.
Diehl, Conrad, (M.I.)	Buffalo, 1878.
Dimon, Theo.	Auburn, 1880.
Dodge, D. A.	Brooklyn, 1860.
*Donaghe, Wm. R.	New York, 1860, 64. (d. 1866.)
Doolittle, A. F.	Herkimer, 1853, 55, 64. (d. 1872.)
Dore, S. G., (M.I.)	Buffalo, 1878.
Dorland, E. T., (M.I.)	Buffalo, 1878.
Douglas, George,	Oxford, 1869, 70, 71, 72, 73, 75, 80.
Douglas, Isaac H.	Utica, 1860, 65, 76.
Douglas, J. Hancock,	New York, 1856, 58, 60, 65.
Downs, Henry S.	New York, 1848, 51, 53, 55, 58, 60, 63, 64, 65, 66, 72, 76, 77. (d. 1879.)
Doyle, Gregory,	Syracuse, 1880.
Drake, Benjamin,	New York, 1846, 64. (d. 1871.)
Draper, John C.	New York, 1866.
Draper, John W.	New York, 1847.
Draper, W. H., (M.)	New York, 1864.
Du Bois, Abram,	New York, 1847, 53, 64.
Du Bois, Hiram G.	Camden, 1874, 76, 78, 80.
Dudley, Wm. H.	Brooklyn, 1864.
Dunlap, Joseph P.	Syracuse, 1864, 76.
Dunn, J., (M.I.)	Lodi, 1878.
Durant, Ghislani,	New York, 1872.
*Dwight, Wm. Cecil,	Moscow, 1853. (d. 1853.)
*Dwight, Wm. W.	New York, 1860. (d. 1861.)
Dwyer, John,	New York, 1864.
Earl, W. C., (M.I.)	Buffalo, 1878.
Earle, Pliny,	New York, 1846, 47, 49, 53, 55.
Earle, S. W.	Tulley, 1878, 80.
Eastman, H. N.	Owego, 1853, 55, 68.
Eastman, Robert W.	Oswego, 1880.
Edgerly, E. F.	Minersville, 1880.
Edwards, Amos S.	Syracuse, 1878.
Ellenwood, A. G.	Attica, 1880.
Elliot, Ellsworth,	New York, 1860, 64, 65, 66, 67, 68, 80.
Eliott, J. C., (M.I.)	Buffalo, 1878.
Ellis, Samuel G.	Lima, 1868, 78.
Ellsberg, Louis,	New York, 1864, 65, 66, 67, 68, 70, 75,
Ellsworth, V. A., (M I.)	East Otto, 1878.
	78.
Ellwood, H. S., (M.I.)	Buffalo, 1878.
Ely, E. T.	New York, 1880.
Ely, Sumner, (M.)	Clarksville, 1846, 53. (d. 1857.)
Ely, W. W.	Rochester, 1856, 60. (d. 1879.)
Emmet, B. McE., (M.I.)	New York, 1880.
Emmet, Thomas Addis,	New York, 1855, 64, 65, 66, 70, 72.
*Enos, De Witt C.	Brooklyn, 1856, 60, 64, 65, 66. (d. 1869.)
Ensign, E. S.	McDonough, 1868.
Evans, Edwin,	Rome, 1876, 80.
Farnham, Horace P.	New York, 1864, 65, 66, 72, 76, 80.
Farrington, J. O.	New York, 1864, 65.
Farrington, John M.	Trumansburg, 1878.
Felter, Mahlon,	Troy, 1870.
Ferguson, E. D.	Troy, 1880.
Ferguson, James,	Glenns Falls, 1864, 65, 72, 74, 80.
Ferguson, J. F.	New York, 1846.
Ferguson, John T.	New York, 1848, 52, 53, 58.

Fesenden, C. S. D.	New York, 1880.
Fields, Wm. J., (M.I.)	New York, 1880.
Finch, Phineas,	Ellenville, 1876.
Finlay, Ed. Shiel,	New York, 1867.
Finnell, Thomas C.	New York, 1855, 58, 64, 65.
Fisher, George Jackson,	Sing Sing, 1858, 60, 64, 72, 76, 80.
Fisher, Lewis, (M.I.)	New York, 1880.
Fitch, Almiron,	Delhi, 1864, 65.
Flandran, Thomas M.	Rome, 1878, 80.
Flint, Austin.	New York, 1846, 47, 49 v.p., 50, 53, 58, 64, 72, 75, 78, 80.
Flint, Austin, Jr.,	New York, 1864, 78.
Flood, P. H.	Elmira, 1880.
*Folsom, Levi,	New York, 1860, 64. (d. 1867.)
Folwell, Mahlon B.	Buffalo, 1878, 80.
Foord, Henry,	Cazenova, 1880.
Fordyce, Benj. A., (M.)	Union Springs, 1878, 80.
Foster, Frank P.	New York, 1872.
Foster, Joel,	New York, 1847, 49, 53, 60, 64, 65, 68, 76, 80.
Foster, S. Conant,	New York, 1847, 49, 53, 64.
Fowler, Geo. B.	New York, 1880.
Fowler, G. R.	Brooklyn, 1880.
Fowler, Joseph, (M.I.)	Buffalo, 1878.
Fox, Eli,	German Flatts, 1864.
Fox, George Henry,	New York, 1876, 80.
*Francis, John W.	New York, 1846, 47, 48, 53. (d. 1861.)
Fraser, Charles Edward,	Rome, 1878.
Freeland, N. H.	Tarrytown, 1876, 80.
Freeman, Norman K.	West Farmes, 1863, 64.
Freeman, N. Marston,	New York, *1865, 66, 80.
Frankel, Julius,	New York, 1864.
French, S. H.	New York, 1854, 58, 64. (d. 1877.)
Freye, P. Y.	East Norwich, 1880.
Fruitnight, J. H., (M.I.)	New York, 1880.
Fuller, Robert M.	New York, 1880.
Furman, Guido,	New York, 1863, 64, 65.
Gail, Wm. H.	E. Aurora, 1878.
Gardner, Augustus K.	New York, 1849, 53, 60, 64. (d. 1876.)
Garrish, John P.	New York, 1853, 55, 60, 64, 65, 66, 68, 69, 70, 72, 73, 74, 76, 80.
Gates, H. A.	Delhi, 1880.
Gay, Charles C. F.	Buffalo, 1863, 68, 76, 78, 80.
Gaylord, L. Merriman,	Sodus, 1860, 78.
Geare, Frederick,	Ogdensburg, 1874, 76, 78.
Gerster, A.	New York, 1880.
Gescheidt, Arith, (M.)	New York, 1853.
Gibbes, Edmund A., (M.)	New York, 1870.
Giberson, C. H.	Brooklyn, 1876. (d. 1879.)
Gibney, V. P.	New York, 1880.
Gifford, Harry, Jr.,	Syracuse, 1880.
Gilbert, R. H., (M.)	1868.
Gilfillan, Wm.	Brooklyn, 1864.
Gillett, Walter R.	New York, 1868, 79.
Gillian, W. C., (M.I.)	New York, 1880.
*Gilman, Chandler R.	New York, 1847, 48, 49, 50, 51, 53, 54, 60. (d. 1865.)
Gilmore, Samuel,	Fleming, 1876, 77.
Glass, J. H.	Watkins, 1880.
Gleeason, Geo. U., (M.I.)	Byron, 1878.
Gluck, Isadore,	New York, 1856.

Goff, J. N., (M.I.)	Cazenova, 1878.
Goldmarte, H., (M.I.)	New York, 1880.
Gomez, Horatio,	New York, 1858, 64, 70.
Goodsell, Thomas,	Utica, 1849. (d. 1864.)
Goodwillie, D. H.	New York, 1872, 76, 80.
Goodyear, Miles,	Cortland, 1851.
Gould, W. Budd,	Lockport, 1878.
Gould, William,	Buffalo, 1860, 77.
Gouley, John W. S.	New York, 1873, 75, 76, 77, 78, 80.
Gourdin, Samuel, (M.)	New York, 1858.
Govan, William,	Stony Point, 1860, 64, 65, 70, 72, 74, 80.
Gray, H. M.	1846.
Gray, Henry C.	N. White Creek, 1849, 58, 60. (d. 1877.)
Gray, John P., (E.P.M.)	Utica, 1864, 70, 76, 77, 78, 80.
Green, Caleb,	Homer, 1853, 64, 70, 72, 76.
Green, David,	New York, 1855.
*Green, Horace,	New York, 1848, 49, 51, 52, 53, 55, 56, 58, 64. (d. 1866.)
Green, Isaac,	New York, 1847, 53. (d. 1864.)
Green, J. C., (M.I.)	Buffalo, 1878.
Green, John W.	New York, 1856, 60, 64.
Green, S. S., (M.I.)	Buffalo, 1878.
Green, Tobias J.	Parrish, 1864.
Gregory, H. H., (M.I.)	New York, 1864.
Griffiths, W. E.	Brooklyn, 1880.
Griscom, John H.	New York, 1846, 47, 53, 58, 63, 64. (d. 1873.)
Griswold, W. R.	New Hartford, 1880.
Gruening, Emil,	New York, 1880.
Guleke, Herman F.	New York, 1864.
Gunn, A. N.	1846.
Gurnsey, D.	Amenia, 1880.
Guthrie, C. B.	New York, 1851.
Haddon, Alexander,	New York, 1880.
Hadley, George,	Buffalo, 1849.
Haight, C. W.	Pleasantville, 1860, 64. (d. 1873.)
Hailes, W., Jr.,	Albany, 1880.
Hall, D. G.	Dunkirk, 1867.
Hall, Edward,	Auburn, 1860, 66, 67. (d. 1870.)
Hall, Wm. H., (M.I.)	New York, 1880.
Halsey, Gains L.	Unadilla, 1872.
Halsted, Thaddeus M.	New York, 1847, 50.
Hamilton, A. McLain, (M.I.)	New York, 1880.
Hamilton, Frank H.	New York, 1848, 53, 55, 58, 60, 64, 68, 77, 78, 80.
Hanks, Horace T.	New York, 1880.
Hannon, Jas. C.	Albany, 1880.
Hard, Patrick H.	Oswego, 1847. (d. 1860.)
Harrington, D. W.	Buffalo, 1878.
Harrington, S. H.	Chenango Forks, 1858.
Harris, Elisha,	New York, 1853, 60, 64, 68, 72, 76, 77, 80.
Hart, Charles A.	New York, 1870, 72.
Hart, Ira F.	Brooklyn, 1878.
*Hart, John,	New York, 1849, 53, 60, 64, 67. (d. 1867.)
Hart, Samuel,	Brooklyn, 1849, 64, 70. (d. 1878.)
Hartt, Henry Le Barron,	New York, 1865. (d. 1880.)
Harvey, A. B.	Poughkeepsie, 1880.

Harvey, C. W., (M.I.)	Buffalo, 1849, 63, 78.
Harvey, Leon F., (M.I.)	Buffalo, 1864, 78.
Harwood, Edward C.	New York, 1870, 72, 75, 76, 80.
Hasbrouck, F.	New York, 1846.
Hasbrouck, Stephen H.	New York, 1846.
Hauenstine, John,	Buffalo, 1878.
Hawks, Horace T.	New York, 1876.
Hawley, J. S.	Brooklyn, 1876, 80.
Hawley, Joel E.	Ithaca, 1849, 54. (d. 1859.)
Hays, Joseph Byron,	Canandaigua, 1865, 72.
Haywood, E. Darwin,	Columbus, 1865. (d.)
Hazeltine, G. W.	Jamestown, 1867.
Heard, A. B.	Ripley, 1880.
Heard, John S.	New York, 1846.
Heaton, Carlton R.	Maine, 1865, 80.
Hebenslreit, Robert, (M.I.)	Buffalo, 1878.
Heinstreet, Thomas B.	Troy, 1868.
Heitzman, Charles, (M.I.)	New York, 1880.
Henderson, F. B.	Whitesborough, 1860.
Hendrick, H. C.	McGrawville, 1860, 72, 80.
Henriques, A. J.	New York, 1864.
Henry, James H.	Brooklyn, 1849, 60.
Henry, Morris H.	New York, 1870, 72, 75.
Henschel, Charles,	New York, 1853, 55, 64.
Herrick, Everett,	New York, 1878, 80.
Herzog, Max.	New York, 1872.
Heywood, C. F.	New York, 1858.
Hibben, James,	Brooklyn, 1853.
Hicks, W. Scott,	Bristol, 1878.
Hill, H. C., (M.I.)	Lockport, 1878.
Hill, J. D., (M.I.)	Buffalo, 1878.
Hillyer, J. H., (M.I.)	New York, 1880.
Hinton, John H.	New York, 1860, 64, 76.
Hodgman, Abbott,	New York, 1876, 77, 80.
Hodgson, Geo. W.	White Plains, 1864, 80.
*Hoffman, Richard K., (M.)	New York, 1853. (d. 1860.)
Hoffman, Wm. S.	Port Byron, 1878.
Hoger, F. F., (M.I.)	Buffalo, 1878.
Holcomb, Wm. Frederick,	New York, 1858, 64. 65, 72, 76, 80.
Homberger, Julius, (X.)	New York, 1863, 65, 68.
Hopkins, G. G.	Brooklyn, 1880.
Hopkins, Henry R., (M.I.)	Buffalo, 1878, 80.
Horton, H. B., (M.I.)	Eden, 1878.
Horton, Henry L.	New York, 1880.
Housel, W., (M.I.)	New York, 1864.
Hovey, B. L.	Rochester, 1858, 70, 78, 80.
How, Lucien,	Buffalo, 1878.
Howard, B.	New York, 1867.
Hubbard, George H.	Lansingburg, 1870, 72. (d. 1876.)
Hubbard, Samuel T.	New York, 1847, 49, 53, 60, 64, 65, 68, 80.
Hubbard, Silas,	Buffalo, 1852.
Hubbell, A. A., (M.I.)	Leon, 1878.
Hudson, E. Darian,	New York, 1876.
Huggins, W. Q.	Sanborn, 1878.
Hun, Edward R.	Albany, 1870. (d. 1880.)
Hunt, D. Brainard, (M.)	New York, 1876. (d.)
Hunt, Jacob,	Utica, 1865, 66.
Hunt, J. H.	Brooklyn, 1880.
Hunt, Sanford B.	Buffalo, 1855.
Hunter, D. C.	Batavia, 1878.

Hunter, James B.	New York, 1870, 78, 80.
Hurd, D. E.	1846. (d.)
Husted, Nathaniel C.	New York, 1856, 58, 60, 64, 65, 66, 70, 72, 73, 74 v.p., 75, 76, 77, 78, 80.
Hutchinson, Edwin, (M.I.)	Utica, 1878, 80.
Hutchison, Joseph C.	Brooklyn, 1855, 58, 60, 64, 66, 70, 72, 76, 78, 80.
Hutton, Robert C.	Howell, 1878.
Hyde, F. E., (M.I.)	Cortland, 1880.
Hyde, Frederick,	Cortland, 1847, 49, 53, 55, 60, 74, 78, 80.
Hyde, Lucius,	Brooklyn, 1847, 49, 50, 51.
Hyde, Miles G.	Cortland, 1876.
Ingrahm, Henry D.	Kennedy, 1876, 77, 78.
Ingrahm, T. M.	Flatbush, 1856.
Ives, Hugh M.	Hastings, 1874, 75, 76, 80.
Jackson, Thomas,	Binghamton, 1855.
Jackson, Wm. H.	New York, 1852, 53.
Jacobi, Abraham,	New York, 1860, 64, 65, 68, 70, 72, 76, 78, 80.
Jacobi, Mary Putnam,	New York, 1880.
Jacobs, Ferris,	Delhi, 1853, 72, 80.
Jacobus, A. M., (M.I.)	New York, 1880.
Janes, Edward H.	New York, 1860, 64, 80.
Janes, Henry, (?)	New York, 1866.
Janeway, Edward G.	New York, 1880.
Jansen, A., (M.I.)	Buffalo, 1878.
Jansen, A. F. D.	Buffalo, 1870.
Janverin, Joseph E.	New York, 1880.
Jarvis, Ebenezer P.	Centre Moriches, 1880.
Jay, J. C., (M.I.)	New York, 1880.
Jenkins, James E.	East Avon, 1874.
Jenkins, J. Foster,	Yonkers, 1853, 55, 58, 65, 74, 75, 76, 77, 80.
Jerome, J. H.	Trumansburg, 1848, 56.
Jewett, Harvey,	Canandaigua, 1848, 52, 53, 55, 56, 64, 66, 70, 72, 74, 78.
Johnson, F. U., (M.)	New York, 1846, 53, 80.
Johnson, Stephen P.	Waterloo, 1874.
Johnson, T. M., (M.I.)	Buffalo, 1878.
Johnson, W.	New York, 1872.
*Jones, Daniel,	Baldwinsville, 1852, 53, 60. (d. 1861.)
Jones, E. Lee,	New York, 1858, 64, 65, 67, 69, 70, 72.
Jones, Joseph B.	Brooklyn, 1860.
Judson, Adoniram B.	New York, 1876, 80.
Kamerling, A., (M.I.)	Buffalo, 1878.
Kammerer, Jos.	New York, 1870. (d. 1875.)
Katzenbach, W. N.	New York, 1880.
Keene, S. S.	New York, 1853.
Keese, Hobert,	New York, 1860.
Kennedy, James,	New York, 1864, 65, 66.
Kenyon, Frank,	Scipio, 1880.
Kerrigan, Joseph A.	New York, 1866.
*Kiernan, James L.	New York, 1860. (d. 1869.)
Kinch, C. A., (M.I.)	New York, 1880.
King, J. E., (M.I.)	Buffalo, 1878.
Kingman, C. M.	Palmyra, 1878.
Kingsley, H. F.	Scoharie, 1880.
Kissam, Daniel E.	Brooklyn, 1864.
Kissam, Richard S.	New York, 1847, 53.
Kitchen, D. H., (M.I.)	Binghamton, 1878.

Knapp, Herman,	New York, 1870, 72, 78, 79, 80.
Kneeland, B. T.	New York, 1880.
Kneeland, Jonathan,	Onondaga, 1864, 76, 78, 80.
Knight, C. C., (M.I.)	Oneonta, 1864.
Knight, C. E., (M.I.)	New York, 1864.
Kohn, S., (M.I.)	New York, 1880.
*Krackowizer, Ernest,	New York, 1855, 60, 64, 65, 68, 72. (d. 1875.)
Lambert, John,	Salem, 1874.
Lanigan, J. A., (M.I.)	Buffalo, 1878.
Lange, F., (M.I.)	New York, 1880.
Langman, G., (M.I.)	New York, 1880.
Lansing, John V.	Albany, 1864.
Lapham, C. H., (M.I.)	Aurora, 1878.
Lapp, Henry, (M.I.)	Clarence, 1878.
Lathrop, G. H.	Wurtsborough, 1880.
Laudon, D. S.	Brooklyn, 1860.
Lawrence, Jonathan S.	New York, 1853, 64, 65.
Lea, Isaac,	Stapleton, 1860, 64.
Leale, Charles A.	New York, 1870, 76, 80.
Leaming, James R.	New York, 1865, 66, 68, 80.
Leaming, John K.	Otsego, 1864.
Lee, Charles A.	Peekskill, 1846, 47, 60, 64, 66, 67, 68, 70. (d. 1872.)
Lee, Charles Carroll, (M.I.)	New York, 1872, 80.
Lee, Charles R.	Fulton, 1878, 80.
Lee, James,	Mechanicsville, 1864.
*Leveridge, Benjamin C., (M.)	New York, 1853. (d.)
Lewis, Daniel,	New York, 1880.
Lientard, A.	New York, 1880.
Lindsley, Jared,	New York, 1848, 49, 53, 60.
Lions, Jonas P.	New York, 1864.
Little, Edward, (M.I.)	Buffalo, 1878.
Little, Geo. S.	Kirkwood, 1855.
Little, James L.	New York, 1864, 65, 67, 70, 72, 80.
Lockwood, T. T.	New York, 1858.
Long, Alfred J.	Whitehall, 1864, 65, 66, 71, 78.
Long, L. H., (M.I.)	Buffalo, 1878.
Loomis, Alfred L.	New York, 1864, 78.
Loomis, H. N., (M.I.)	Buffalo, 1878.
Loring, E. D., (M.I.)	New York, 1880.
Lothrop, B. L., (M.I.)	Buffalo, 1878.
Lothrop, Thomas,	Buffalo, 1878.
Luck, J. T.	New York, 1872.
Lusk, Wm. T.	New York, 1872, 75.
Ludlum, Wm. S.	New York, 1865.
Lyman, Elijah S.	Sherman, 1864, 65, 76, 80.
Lyman, Henry C.	Sherburne, 1880.
Lyman, H. H., (M.I.)	Alleghany Co., 1864.
Lynch, John,	New York, 1864.
Lynde, U. C., (M.I.)	Buffalo, 1878.
Lyon, E. M.	Plattsburg, 1880.
Lyon, Irving W.	New York, 1864.
Luce, W. O.	Auburn, 1880.
McCall, John,	Utica, 1846, 47, 49, 53, 55, 58. (d. 1867.)
McClellan, Christopher R.	Brooklyn, 1866.
McCready, B. W., (M.)	New York, 1853.
Macdonald, A. E., (M.I.)	New York, 1880.
McDonald, S. N., (M.I.)	Buffalo, 1878.
McEwen, John B.	New York, 1860. (d. 1867.)

McEwen, R. C.	Saratoga Springs, 1880.
McFarlan, Ebenezer,	New York, 1847, 53, 64.
McFarland, S. F.	Oxford, 1872, 76.
McGregor, James R.	New York, 1872.
McIlvain, Robert R.	New York, 1872, 80.
McIntyre, Alexander,	Palmyra, 1846, 51, 52, 54. (d.)
MacKay, G. E., (M.I.)	Buffalo, 1878.
McKay, Lawrence,	Rochester, 1856. (d.)
McLaury, Wm. M.	New York, 1880.
McLean, Le Roy,	Troy, 1870, 72, 80.
McLeod, S. B. W.	New York, 1872, 80.
McMillen, Charles,	Fordham, 1860.
McNaughton, James,	Albany, 1846, 47, 53, 63, 64, 70, 72. (d. 1874.)
Macneil, Dougald, (M.I.)	Buffalo, 1878.
McNevin, Wm. H.	New York, 1853. (d.)
McNulty, John,	New York, 1856, 58, 65.
McNutt, Hiram,	Warrensburg, 1865.
*McPhail, Leonard C.	Brooklyn, 1853. (d. 1867.)
McPherson, G. W., (M.I.)	Lancaster, 1878.
McSweeney, Daniel E., (M.I.)	New York, 1864.
Magie, David, (M.I.)	New York, 1880.
Manley, Jas.	Brooklyn, 1858.
Manley, James R.	New York, 1846, 47. (d. 1851.)
Mann, M. D.	New York, 1876.
Mansfield, J. R.	New York, 1865.
*March, Alden,	Albany, 1847, 49, 50, 52, 53, 54, 55, 57, 58, 60, 63 P., 64, 65, 66, 67, 68, 69. (d. 1869.)
March, Henry,	Albany, 1880.
Marclay, J. Irving, (M.I.)	Buffalo, 1878.
Markoe, Thomas M.	New York, 1853, 64.
Marsh, M. M.	Manlius, 1859. (d. 1868.)
Martin, G. R.	North Creek, 1875.
Mason, Erskine,	New York, 1868, 80.
Mason, Lewis, D.	Brooklyn, 1870.
Mason, Theodore L.	Brooklyn, 1846, 58, 60, 64.
Mason, V. W.	Canastown, 1864.
Mason, Wm. H.	Buffalo, 1864.
Matthews, J. D., (M.I.)	Buffalo, 1878.
Matthewson, Arthur,	Brooklyn, 1870.
Mattison, J. B.	Brooklyn, 1880.
Maxwell, Wm. H., (M.)	New York, 1853.
Maynard, A. W., (M.I.)	New York, 1880.
*Meisel, H., (M.)	Elmira, 1870. (d. 1872.)
Menzel, R. J.	Caledonia, 1878.
Mercer, Alfred,	Syracuse, 1860, 78.
Merritt, J. King,	New York, 1864.
Messenger, John,	New York, 1868.
Metcalfe, John T.	New York, 1847, 49, 53, 55, 58, 65.
Metcalfe, S. W.	Owego, 1872. (d. 1874.)
Milhan, John P.	New York, 1866.
*Miller, John,	New York, 1853. (d. 1863.)
Miller, W. V., (M.I.)	Buffalo, 1878.
Millington, S. R., (M.)	Poland, 1853.
Miner, Julius F.	Buffalo, 1864, 70, 74, 78.
Minor, James M.	New York, 1852, 53, 56, 60, 64, 77. (d. 1879.)
Minor, W. W.	1846.
Mitchell, Chauncey L.	Brooklyn, 1846, 60.
Mitchell, Henry,	Brooklyn, 1849, 50, 53. (d. 1856.)

Mixer, S. F.	Buffalo, 1850, 78.
Moe, Erastus C.	Groton, 1860.
Monell, Jos. A.	New York, 1880.
Montgomery, Henry F.	Rochester, 1878.
Moody, Mary J., (M.I.)	Buffalo, 1878.
Moore, Edward M.	Rochester, 1864, 70, 72, 73, 74, 75, 78, 80.
Moore, J. W.	Cohoes, 1880.
Moore, M. S.	Fredonia, 1878.
Monell, Joseph A.	New York, 1855, 58, 64, 65, 72, 73, 76.
Morrell, Joseph S.	Glen Cove, 1860.
Morris, Morean,	New York, 1864, 75.
Morris, Philip V. N.	Buskirk Bridge, 1856, 58, 60, 64.
Morris, Richard L.	New York, 1846, 49, 53, 58.
Morrow, C. R., (M.I.)	Buffalo, 1878.
Morse, Verranus,	New York, 1867.
Morton, J. C.	New York, 1872.
Moses, Israel,	New York, 1847.
Mosher, Jas., (M)	1872.
Mott, Alex. B., (M.)	New York, 1864.
*Mott, Valentine,	New York, 1847, 53. (d. 1865.)
Mott, Walter,	Schuylersville, 1853,
Moulton, Peter,	New Rochelle, 1853, 64, 60. (d. 1873.)
Munde, Paul F.	New York, 1876, 80.
Munger, Charles,	Knoxboro, 1878.
Munson, W. W.	Otisco, 1878, 80.
Murbach, A. J., (M.)	Fulton Co., 1876.
Murray, W. D., (M.I.)	Tonawanda, 1878.
Murry, H. B., (M.I.)	Tonawanda, 1878.
Mynter, Herman, (M.I.)	Buffalo, 1878, 80.
Nash, W. H., (M.I.)	New York, 1880.
Neftel, Wm. B.	New York, 1870, 72.
Nellis, A., Jr., (M.I.)	Montgomery Co., 1880.
Nelson, W. H.	Taberg, 1872.
Nesbitt, John H., (M.I.)	New York, 1880.
Newhaus, Charles,	Brooklyn, 1860.
Newman, James M.	Buffalo, 1855, 56.
Newman, Robert,	New York, 1872, 76, 78, 80.
Newton, Homer G.	Brooklyn, 1868.
Nichell, Henry,	Buffalo, 1863, 78.
Nichol, H. D., (M.I.)	New York, 1880.
Nichols, Charles H.	New York, 1880.
Nichols, Elias S., (M.)	New York, 1853.
Nichols, Truman,	New York, 1866.
Nivison, Nelson,	Burdell, 1860, 66, 80.
Norris, H. F., (M.I.)	New York, 1880.
North, Nelson L.	Brooklyn, 1864, 65, 67, 68, 69.
Nott, S. E. S. H., (M.I.)	White's Corner, 1878.
Noxon, B. W.	Ballston Spa, 1880.
Noyes, Henry D.	New York, 1864, 65, 66, 72, 76, 80.
Nye, H. H., (M.I.)	Wellsville, 1864.
O'Brien, E. C. W.	Buffalo, 1874, 78, 80.
Odell, Evander,	Madilla, 1864, 70.
O'Donoughue, E.	Bergen, 1853. (d. 1867.)
*Ogden, Benjamin,	New York, 1848, 53, 60. (d. 1867.)
Oppenheimer, Henry S.	New York, 1880.
Ordronaux, John,	New York, 1864.
Ormiston, Robert,	Brooklyn, 1864.
Orton, John Gray,	Binghamton, 1855, 64.
Osborn, Harris B.	Sherman, 1876, 78.
Osborn, Samuel J., (M.)	New York, 1853.

O'Sullivan, Richard J.	New York, 1864, 70, 72, 78, 80.
Otis, F. N.	New York, 1880.
Otterson, Andrew,	Brooklyn, 1853, 60.
Otterson, W. C., (M.)	New York, 1872.
Packard, C. W.	New York, 1880.
Pallin, Montrose A.	New York, 1879, 80.
Palmer, Charles Newell,	Lockport, 1878, 80.
Palmer, H. C.	Rome, 1880.
Palmer, J. W.	Victor, 1864, 65, 72.
Pamphilon, Henry,	Stafford, 1878, 80.
Pardee, C. I., (M.I.)	New York, 1880.
Pardee, Daniel,	Fulton, 1880.
Parker, Bradley,	New York, 1846.
Parker, Edward H.	Poughkeepsie, 1880.
Parker, Theodore, (M.I.)	New York, 1870.
Parker, Willard,	New York, 1846, 48, 49, 53, 58, 60, 64.
Parkhurst, Wm. H. H.	Frankford, 1855.
Parmelee, Francis D.	Greenbush, 1880.
Parr, John,	Buel, 1880.
Parsons, Israel,	Marcellus, 1874, 78.
Parsons, John,	Kings Bridge, 1872, 80.
Pattison, Granville S.	New York, 1846, 47, 49. (d. 1851.)
Pattison, G. W., (M.I.)	Buffalo, 1878.
Pease, Roger W.	Syracuse, 1872.
Peaslee, E. Randolph,	New York, 1860, 64, 65, 68, 76. (d. 1879.)
Peet, Henry T., (M.I.)	New York, 1853.
Pelton, Lewis F.	Mount Kisko, 1864.
Percy, Samuel R.	New York, 1864.
Perry, J. G.	New York, 1872.
Peters, George A.	New York, 1853, 64.
Peters, John C.	New York, 1868, 80.
Pettet, John A., (M.I.)	Buffalo, 1878.
Phelps, E. B.	Owego, 1860.
Phelps, James L.	New York, 1849, 50, 51, 52, 53, 54, 55, 56, 58. (d. 1869.)
Phelps, Jos. L.	New York, 1847.
Phelps, W. C.	Buffalo, 1878.
Phillips, D., (M.I.)	New York, 1880.
Phillips, S. B.	New York, 1849, 53.
Pierce, J. B.	Lyons, 1848, 49.
Pifford, Henry G.	New York, 1865, 80.
Pilcher, Lewis S.	Brooklyn, 1874.
Pine, Per Lee,	Poughkeepsie, 1878, 80.
Pitkin, L. F., (M.I.)	New York, 1880.
Plant, Wm. T.	New York, 1880.
Polk, Wm. M.	New York, 1880.
Pomeroy, Charles G.	Newark, 1853, 55, 56, 58, 64, 78.
Pomeroy, Orin D.	New York, 1870, 72.
Pond, James O.	New York, 1849, 53, 55, 58, 60, 64, 72.
Pope, Harold H.	Rome, 1856, 58, 65.
Porter, Henry N.	New York Mills, 1860, 64, 66, 68, 70, 72, 76, 78, 80.
*Porter, Mortimer G.	New York, 1860. (d. 1863.)
Porter, W. W.	Syracuse, 1876, 78, 80.
Post, Alfred C.	New York, 1846, 48, 53, 55, 56, 64, 66, 67, 68 V.P., 72, 76, 78, 79, 80.
*Potter, Millon G.	Buffalo, 1872. (d. 1878.)
Potter, Uriah,	Minden, 1856. (d. 1869.)
Potter, W. W., (M.I.)	Batavia, 1878, 80.
Pratt, J. Frank,	Mayville, 1880.

Preston, Wm. S.	Patchogue, 1880.
Prince, C.	New York, 1865, 66.
Pritchard, H. B.	Euclid, 1880.
Prout, J. S.	Brooklyn, 1872.
Pruden, T. Mitchell, (M.I.)	New York, 1880.
Punnett, ——,	New York, 1848.
Purdy, Alfred E. M.	New York, 1870, 72, 80.
*Purdy, Jotham,	Elmira, 1853. (d. 1858.)
Purdy, Samuel A.	New York, 1853, 60.
Purple, Samuel S.	New York, 1853, 55, 58, 60, 64, 72, 76, 80.
Quackenbush, J. V. P.	Albany, 1864. (d. 1876.)
Raborg, S. A., (M.I.)	New York, 1880.
Ramsay, Cyrus,	New York, 1864, 65.
Ransom, Edward G., (M.)	New York, 1870.
Raphael, Benjamin I.	New York, 1860, 64, 66, 68, 70, 72.
*Rathbone, Joshua H.	Jamestown, 1871. (d. 1877.)
Raymond, Charles H., (M.)	New York, 1853.
Raymond, Wm. C.	Cambria, 1878.
Record, Henry A.	Mayville, 1878, 80.
*Reese, D. Meredith,	New York, 1847, 48, 49, 53, 55, 57 V.P., 58, 59, 60. (d. 1861.)
Reese, Wm. W.	Brooklyn, 1864, 72, 76, 80.
Reid, A. D.	Cincinnatus, 1864.
Reid, John,	Rochester, 1855.
Reid, Wm. W.	Rochester, 1860. (d.)
Reynall, W. H., (M.I.)	Dansville, 1856.
Reynolds, G. P.	Burdett, 1876.
Reynolds, Jas. B.	New York, 1865.
Reynolds, Jesse,	Pottstown, 1874, 79, 80.
Reynolds, John H.	Wilton, 1853. (d. 1870.)
Reynolds, R. C.	Pittsfield, 1878, 80.
Reynolds, Tabor B.	Wilton, 1849, 53, 64, 65, 78.
Rhodes, Sumner,	Ithaca, 1864. (d.)
Rice, Wm. H.	Phœnix, 1880.
Richards, J. W.	New York, 1852, 64, 65.
Richardson, Jas. G., (M.)	Philadelphia, 1867. (?)
Rightwise, Geo., (M.I.)	Jacksonville, 1878.
Riddell, S. S.	Norwich, 1874. (d.)
Ring, William, (M.I.)	Buffalo, 1878, 80.
Robb, Wm. H.	Amsterdam, 1878, 80.
Robson, B. R.	New York, 1846.
Roche, Paul,	Schenectady, 1880.
Rochester, Thomas F.	Buffalo, 1860, 64, 78, 79.
Rockwell, Frank W.	Brooklyn, 1880.
Rockwell, William,	New York, 1851, 52, 53, 55, 56, 60. (d. 1868.)
Rodgers, J. Kearney,	New York, 1849. (d.)
Rodgers, R. K., (M.I.)	1856.
Roe, J. O.	Rochester, 1880.
Rogers, Alex. W.	New York, 1864.
Rogers, David L.	New Rochelle, 1858, 59.
Rogers, Henry Raymond,	Dunkirk, 1868, 70, 74, 76, 77, 78.
Rogers, Stephen,	New York, 1865.
Roosa, D. B. St. John,	New York, 1880.
Root, Franklin W.	Hamilton, 1864.
Rose, Jas. M.	West Winfield, 1880.
Russ, John D.	New York, 1847.
Russell, Charles P.	Utica, 1878.
Russell, Wm.	Utica, 1864, 80.
Sabin, S. A.	Palmyra, 1870.

St. John, Samuel,	New York, 1857, 60.
Salmon, H. B.	Stuyvesant, 1865.
Sandford, W. F.	Brooklyn, 1875, 80.
Sands, D. Jerome,	Rye, 1860.
Sands, Henry B.	New York, 1864, 70.
Satterlee, F. L.	New York, 1872.
Satterlee, F. Le Roy,	New York, 1880.
Satterthwaite, T. E.	New York, 1880.
Saunders, Augustus L.	Brookfield, 1853, 55, 59, 64, 65, 68, 78.
Saunders, J. H., (M.I.)	Belfast, 1864.
Savage, James,	Argyle, 1867.
Sawyer, P. R. H.	Bedford, 1880.
Sayre, C. H. H., (M.I.)	New York, 1879. (d. 1880.)
Sayre, Lewis A.	New York, 1848, 53, 54, 55, 58, 59, 60, 64, 65, 66, 67, 68, 69, 70 V.P., 72, 74, 75, 76, 77, 78, 79, 80 P.
Sayre, Lewis H., (M.I.)	New York, 1880.
Schenck, P. L.	Flatbush, 1876.
Schilling, Ernest,	New York, 1853, 55, 68.
Schoonmaker, E. J.	Magee's Corner, 1880.
Schoonover, Warren,	New York, 1880.
Schmid, H. Ernest,	White Plains, 1880.
Scott, G. H.	Owego, 1872.
*Scribner, James W.	Tarrytown, 1871, 78. (d. 1880.)
*Seguin, Edward,	New York, 1872, 73, 74, 76, 77, 78, 79, 80. (d. 1880.)
Segur, Benj. A.	New York, 1876.
Selden, J. Cary,	New York, 1859.
Sell, Edward H. M.	New York, 1867, 68, 69, 70, 74, 75, 76, 80.
Sewall, John G.	New York, 1870. (d. 1874.)
Sexton, Samuel,	New York, 1873, 80.
Seymour, Wm. P.	Troy, 1877.
Shanks, John,	New York, 1855, 60.
Shantz, Samuel E.	Utica, 1865. (d. 1868.)
Sharer, John P.	Little Falls, 1880.
Sharretts, C. J., (M.I.)	New York, 1880.
Shaw, A. C., (M.I.)	Hamburg, 1878.
Shaw, M. H., (M.I.)	Buffalo, 1878.
Shelton, John D.	Jamaica, 1856, 58.
Sherman, B. F.	Ogdensburg, 1872, 80.
Sherwell, Samuel,	Brooklyn, 1876, 80.
Sherwood, Burritt, (M.)	New York, 1849.
Shove, Seth,	Katonah, 1860, 64. (d. 1878.)
Shrady, George F.	New York, 1860, 64, 66, 74.
Shrady, John,	New York, 1867, 68, 80.
Shiland, A. W.	West Troy, 1878.
Shumway, Samuel,	Essex, 1860, 66. (d. 1874.)
Silver, Henry M.	New York, 1880.
Sims, J. Marion,	New York, 1858, 60, 72, 74, 75, 76 P., 77, 80.
Skene, A. J. C.	Brooklyn, 1872, 76.
Skilton, Avery J.	Troy, 1848, 49. (d.)
Slacer, W. H., (M.I.)	Buffalo, 1878, 80.
Sloan, James, (M.I.)	Buffalo, 1878.
Slocum, C. O.	Syracuse, 1880.
Slocum, J. O.	Camillus, 1878, 80.
Smith, A. A.	New York, 1880.
Smith, Albert,	New Rochelle, 1847, 52, 53, 60.
Smith, Andrew H.	New York, 1876.
Smith, B. F.	Mt. Upton, 1872. (d.)

Smith, Charles D.	New York, 1847, 48, 49, 53.
Smith, C. P.	Chester, 1880.
Smith, George K.	Brooklyn, 1866, 68, 70, 72.
Smith, Gilbert,	New York, 1846.
Smith, Gouverneur M.	New York, 1858, 60, 64, 68, 72, 76, 80.
Smith, Heber,	New York, 1869, 72.
Smith, Horatio S.	Brooklyn, 1853, 64, 69.
Smith, James S., (M.I.)	Buffalo, 1878.
Smith, Jerome Candee,	New York, 1864, 65, 66, 67, 69, 70, 72, 76.
Smith, J. Lewis,	New York, 1864, 80.
*Smith, Joseph M.	New York, 1847, 48, 49, 52, 53, 55, 58, 60, 64. (d. 1866.)
Smith, Joseph T.	Canandaigua, 1860, 72, 80.
Smith, Montross Leslie,	New York, 1866.
Smith, S. Hanbury,	New York, 1864, 80.
Smith, Stephen,	New York, 1853, 55, 79.
Smith, Whiting,	Whitesboro, 1860.
Smith, Wm. Manlius,	Manlius, 1870.
Snow, Norman L.	Albany, 1880.
Snow, Simeon,	Root, 1849, 53. (d. 1865.)
Snyder, Morgan,	Fort Plain, 1847.
Sonnick, Peter, (M.I.)	Buffalo, 1878.
Speir, S. Fleet,	Brooklyn, 1866, 64.
Spencer, John,	Westfield, 1874, 77.
Spencer, Thomas, (M.I.)	Geneva, 1847. (d. 1857.)
Sprague, Jenks S.	Exeter, 1847, 49, 50, 53, 63. (d. 1879.)
Sprague, L. S.	Williamson, 1860, 70.
Sprague, W. B.	Pavillon, 1874.
Spratt, Geo. R.	Clymer, 1872.
Squibb, Edward R.	Brooklyn, 1860, 64, 66, 70, 72, 76, 77.
Squire, T. H.	Elmira, 1868.
Stanchfield, J. K.	Elmira, 1864.
Stanley, W. S.	Mamaronick, 1865.
Starr, Charles S.	Rochester, 1872.
Statts, Barent, (M.I.)	New York, 1864.
*Statts, Barent P.	Albany, 1853, 64. (d. 1871.)
Staube, F.	New York, 1858.
Stearns, C. W., (M.I.)	New York, 1864.
*Stearns, John, (M.I.)	New York, 1846, 47. (d. 1848.)
Stern, Alex. W.	New York, 1870, 72, 80.
Stephenson, Marcus P.	New York, 1858, 64, 55, 66, 69, 70.
*Stephenson, Mark,	New York, 1850, 51, 63, 55, 58, 60. (d. 1865.)
Stevens, Alexander H.	New York, 1846, 47 V.P., 48 P., 49, 51, 53. (d. 1869.)
Stevens, L.	Constantia, 1864.
Stevens, Wm.	Cairo, 1880.
Stevenson, W. G.	Poughkeepsie, 1880.
Stewart, F. Campbell,	New York, 1846, 47, 48, 52, 53, 55.
*Stewart, James,	New York, 1846, 53. (d. 1864.)
Stewart, Philander,	Peekskill, 1853, 60, 64. (d. 1874.)
Stiles, C. L.	Owego, 1880.
Stiles, R. Cresson,	Flatbush, 1865.
Stillman, Sidney,	Millerton, 1865.
Sterling, Thomas B.	New York, 1864.
Stone, John O.	New York, 1853, 64. (d. 1868.)
Stonehouse, John B.	Albany, 1880.
Storck, Edward,	Buffalo, 1863, 78.
Stout, Arthur B.	New York, 1847, 48.
Stoner, George W., (M.I.)	Buffalo, 1878.

Strew, Wm. W.	New York, 1858, 60, 64.
Stromach, Y. W., (M.I.)	New York, 1880.
Strong, Maltby,	1846.
Strong, O. C., (M I.)	Colden, 1878.
Strong, P. H., (M.I.)	Buffalo, 1878.
Strong, Thomas D.	Westfield, 1871, 72, 73, 78, 80.
Studevant, James M.	Rome, 1858, 60, 64. (d. 1873.)
Sturgis, Fred. R.	New York, 1880.
*Suckley, George,	New York, 1860, 66. (d. 1869.)
Susdorf, G. E., (M.I.)	New York, 1880.
Sutherland, A. R., (M.I.)	Tonawanda, 1878.
Swaine, Charles H.	Cortlandville, 1856.
Sweet, John A.	New York, 1846, 47, 48, 49, 53. (d.)
Sweetland, G., (M.I.)	Evans, 1878.
Swineburn, John,	Tomkinsville, 1853, 64, 65.
*Taft, Marcus L.	New York, 1849. (d. 1850.)
Tauszky, Rudolph,	New York, 1876.
Taylor, Charles F.	New York, 1866, 68, 70, 77.
Taylor, Isaac E.	New York, 1853, 64, 72, 80.
Taylor, J. H., (M I.)	Holley, 1878.
Taylor, James Ridley,	New York, 1878, 80.
Taylor, R. W., (M.I.)	New York, 1880.
*Taylor, Wm.	Manlius, 1853, 64. (d. 1865.)
Teats, Sylvester, (M.)	New York, 1864.
Tefft, E. B.	Albany, 1880.
Tefft, Lake Innocent,	Syracuse, 1846, 47, 66, 67, 69, 72, 74, 75. (d. 1880.)
Telkampf, Theodore A.	New York, 1855.
Thayer, Wm. Henry,	Brooklyn, 1872.
Thomas, Daniel G.	Utica, 1850, 59, 64.
Thomas, J. C., (M.I.)	New York, 1880.
Thomas, Otto, (M.I.)	Buffalo, 1878,
Thomas, T. Gaillard,	New York, 1880.
Thoms, William Faulds,	New York, 1867, 68, 69, 74, 75, 80.
Thompson, Abm. Gardner,	New York, 1847, 53, 72, 76, 80.
*Thompson, Alexander,	Aurora, 1853, 64. (d. 1869.)
Thompson, A. H.	Walden, 1856.
Thompson, A. N.	Norfolk, 1880.
Thompson, Bradford S.	New York, 1870.
Thompson, J. H.	Goshen, 1876.
Thomson, Alex., (M.I.)	1856.
Thomson, Wm. H.	New York, 1864.
Thorn, James,	Troy, 1852. (d. 1876.)
Thorne, J. Sullivan,	New York, 1846.
Tinkham, J. H., (M.)	Owayo, 1877.
Tobie, E.	Erie Co., 1863, 78.
Todd, John E., (M.)	Baldwinsville, 1855. (d. 1868.)
Tompkins, H. C.	Knowlsville, 1878.
Tourtellot, Louis A.	Utica, 1865, 80.
Townsend, Howard,	Albany, 1858, 63, 64. (d. 1867.)
Townsend, James C.	Glen Cove, 1860.
Townsend, Morris W.	Bergen, 1860, 76.
Townsend, Wm. P.	Goshen, 1864.
Tozier, L. L.	Batavia, 1878.
Trask, James D.	White Plains, 1853, 58.
Trask, James D., Jr.,	Astoria, 1860, 64, 80.
Tredwell, Samuel,	North Hempstead, 1864.
*Trenor, John,	New York, 1852, 53. (d. 1867.)
Trenor, John, Jr.,	New York, 1858, 59.
Trowbridge, J. S., (M.I.)	Buffalo, 1878.

Trowbridge, Laurence D., (M.I.)	Niagara, 1878.
Turner, Thomas,	Flatbush, 1855, 56.
Tuttle, John T.	New York, 1860.
Underhill, Alfred,	New York, 1860, 63, 64, 65, 66, 70. (d. 1873.)
Underhill, R. T.	New York, 1846.
Van Aernim, Henry,	Franklinville, 1878.
Van Arsdale, H., (M.)	New York, 1853.
Van Buren, Peter,	New York, 1852, 53, 60, 65, 70. (d. 1873.)
Van Buren, W. H.	New York, 1847, 53.
Van Derhoof, F. D.	Phelps, 1878, 80.
Vanderpoel, S. O.	New York, 1853, 72, 79.
Vanderveer, Albert,	Albany, 1879, 80.
Vanderveer, J. R.	Brooklyn, 1878, 80.
Vandervoort, John L.	New York, 1864.
Van Dyck, Andrew,	Oswego, 1864. (d. 1871.)
Van Hovenbergh, J. O.	Kingston, 1860.
Van Kleek, John R.	New York, 1846, 47, 48, 49, 51, 53, 56, 60, 64, 65, 66. (d. 1876.)
Van Pelt, Moses D.	New York, 1851, 53, 58, 64.
Van Pelt, Wm.	Williamsville, 1878.
Van Peyma, P. W., (M.I.)	Buffalo, 1878.
Van Ramdohr, C. A., (M.I.)	New York, 1880.
Van Rensselaer, Alex.	New York, 1849.
*Velder, Louis,	Elmira, 1870. (d. 1877.)
Voorhees, Wm.	Lisle, 1864.
Voss, Lothar,	New York, 1864, 65, 66, 68.
Vroomson, C. W.	Brooklyn, 1880.
Wade, T. Anderson,	Brooklyn, 1855. (d.)
Wagner, C., (M.I.)	New York, 1880.
Waitzfelder, Edw.	New York, 1880.
Walker, Henry F., (M.I.)	New York, 1880.
Walker, Jerome,	Brooklyn, 1872, 74.
Wallace, Wm.	Brooklyn, 1880.
Walser, Theodore,	Tompkinsville, 1864.
Ward, C. S., (M.I.)	New York, 1880.
Ward, Edwin F.	New York, 1880.
Warner, Everadus B.	New York, 1855, 64, 65, 68, 70, 72.
Warren, James,	New York, 1849, 53, 55, 58.
Waterhouse, A.	Jamestown, 1878.
Watkyns, Alfred,	1847. (d. 1876.)
Watson, John,	New York, 1846, 47, 48, 50, 52, 53, 55, 56, 58, 60. (d.)
Watts, Robert, Jr.,	New York, 1847, 49, 52, 53, 64. (d. 1867.)
Weaver, Lewis F.	Syracuse, 1878.
Webb, Edwin,	Hempstead, 1860.
Weber, G. I. E.	1856.
Weber, Leonard,	New York, 1864.
Webster, David,	New York, 1880.
Weed, Samuel,	Clyde, 1864.
Weeks, Cyrus,	New York, 1849, 53.
Weir, R. F.	New York, 1880.
Weisse, Faneuil D.	New York, 1880.
Welch, W. H., (M.I.)	New York, 1880.
Wells, Geo. W., (M.I.)	New York, 1872, 73, 80.
West, Henry S.	Binghampton, 1853, 55. (d. 1876.)
West, J. E.	Utica, 1880.
West, M. Calvin,	Rome, 1864, 65, 76.
West, Silas,	Binghamton, 1856. (d. 1859.)

Weisse, F. D.	New York, 1872.
Westbrook, B. F.	Brooklyn, 1880.
Wey, Wm. C.	Elmira, 1864, 65, 66, 70, 72.
Whaley, James S.	Rome, 1863.
Wheelen, Lewis C.	Troy, 1853.
Wheelock, Geo. G., (M.I.)	New York, 1880.
Whitaker, J.	Buffalo, 1864.
Whitbeck, C. E.	Cohoes, 1880.
Whitbeck, John F.	Rochester, 1864, 65, 74, 77, 78, 80.
Whitbeck, John W., (M.I.)	Rochester, 1878, 80.
White, Devillo,	Sherburne, 1849, 53. (d.)
White, F. V.	New York, 1880.
White, G. H., (M.)	Erie Co., 1846.
White, L. H.	Fishkill, 1880.
White, James P.	Buffalo, 1849, 50, 53, 54, 55, 58, 60, 64, 70, 72, 74, 77, 78 V.P., 80.
White, Oliver,	New York, 1851, 52, 53, 60, 64, 65. (d. 1879.)
White, Philander, (M.I.)	Oswego, 1864.
*White, Samuel P.	New York, 1846, 48, 49, 53, 55, 60. (d. 1867.)
White, Whitman,	New York, 1870.
White, Wm. T.	New York, 1866, 76, 80.
Whitehead, W. R.	New York, 1868.
Whitney, D. B.	East Norwich, 1880.
Whiton, Henry B.	Troy, 1872.
*Whittlesey, Henry N.	New York, 1860, 64. (d. 1869.)
Whittlesy, E., (M.)	1872.
Wiggins, Hiram,	Elbridge, 1878.
Wight, Jarvis S.	Brooklyn, 1880.
Wigton, Jacob S.	Spring Valley, 1880.
Wilber, H. C.	Pine Plains, 1880.
Wilbur, H. B.	Syracuse, 1860.
Wilbur, L. F.	Honeoye, 1864.
Wilcox, Charles H.	Buffalo, 1853, 55, 58. (d. 1862.)
Wilder, B. G.	Ithaca, 1880.
Willard, Augustus,	Greene, 1846, 47, 49, 53, 55, 60, 64. (d. 1868.)
*Willard, Sylvester,	Albany, 1860, 64. (d. 1865.)
Williams, William H.	Brooklyn, 1860, 80.
Wilson, A. Duncan,	Brooklyn, 1864.
Wilson, Peter,	1846.
Wilson, T. C.	De Wittville, 1880.
Wing, Joel A.	Albany, 1846, 47. (d. 1855.)
Winnie, Charles,	Buffalo, 1846. (d. 1877.)
Winslow, John,	New York, 1872.
Winston, Gustavus S.	New York, 1865, 66, 67, 68, 70, 71, 72, 73, 75, 76.
Winton, Nelson,	Havana, 1853. (d. 1864.)
Witthaus, R. A., (M.I.)	New York, 1880.
Wittman, Carl,	Brooklyn, 1865.
Wolcott, Samuel G.	Utica, 1864, 65, 66, 68, 70, 71, 77, 78, 80.
Wood, C. H.	New York, 1866, 74.
Wood, Charles S.	New York, 1867, 70, 72, 76, 77, 78, 80.
Wood, H. C., (M.)	Ontario Co., 1876.
Wood, James R.	New York, 1846, 47, 48, 49, 50, 51, 53, 56, 57, 58, 60, 64, 75, 76, 80.
Wood, Isaac,	New York, 1846, 49, 50, 53, 55, 64. (d. 1868.)
Wood, Marcus,	Geneva, 1870, 80.

Woodbury, P. B.	1849.
Woodhull, H. W. B.	New York, 1858, 64.
Woodward, G. F.	New York, 1853.
Woodward, G. H.	Big Flats. 1880.
Woodward, G. T., (M.I.)	1850.
Woolley, J. V. S.	New York, 1872.
Worster, Joseph,	New York, 1849, 51, 53, 55, 58, 60, 64, 65, 68.
Wright, Fred. A.	Glen Cove, 1880.
Wright, Williston, (M.I.)	New York, 1880.
Wunderlich, F. W.	Brooklyn, 1880.
Wyckoff, C. C.	Buffalo, 1863. 64, 65, 67, 70, 75, 78, 80.
Wylie, W. Gill,	New York, 1876, 80.
Yale, Le Roy M.	New York, 1880.
Zabriskie, ——,	Flatbush, 1859, 76.

NORTH CAROLINA.

Ash, E. N., (M.I.)	Wadesborough, 1872.
Davis, P. W., (M.I.)	1857.
Dewey, Charles F.	Goldsborough, 1855, 58. (d.)
Dickson, James H.	Wilmington, 1852, '60.
Duffy, Charles, Jr.,	Newbern, 1878.
Duffy, Frank,	Newbern, 1879.
Erwin, John S.	Marion, 1851, 52.
Gibbon, J. H., (M.I.)	Charlotte, 1858.
Glertsman, Wm.	Asheville, 1880.
Grissom, Eugene,	Raleigh, 1876, 77, 79.
Haywood, Fabius J., Jr.,	Raleigh, 1870.
Hicks, Robert J.	Williamstown, 1873.
Howard, W. T., (M.I.)	Warrenton, 1852.
Hughes, James B.	Newbern, 1873.
Jones, J. B.	Chapel Hill, 1851.
Lundsden, W. J., (M.I.)	Elizabeth City, 1880.
Mabrey, B. W.	Tarborough, 1855.
Manson, O. F.	Townsville, 1855.
McKee, W. H.	Raleigh, 1851, 58.
McKee, W. L.	Morgantown, 1851.
Mercer, J. R.	Tarborough, 1851.
Miller, J. M.	Charlotte, 1879.
Myers, J. G. B.	Washington, 1852.
Norcom, W. A. B.	Edenton, 1872.
Norwood, Walter A.	Hillsborough, 1850.
O'Hagan, C. J.	Greenville, 1872, 76.
Pierce, A. B.	Halifax, 1858.
Pittman, Newsom J.	Tarborough, 1849, 51, 55, 58, 72, 75, 76, 77 v.p., 80.
Shaffner, J. F.	Salem, 1872.
Shaw, Henry M., (M.I.)	Indian Town, 1858.
Staten, L. L.	Tarborough, 1880.
Summerell, J. I.	Salisbury, 1858.
Thomas, W. George,	Wilmington, 1851.
Thompson, J. R.	Raleigh, 1851, 55.
Tucker, Jos. J. W., (M.)	1852.
Tull, J. Graham,	Newbern, 1853, 58.
Walker, Joshua C., (M.I.)	Wilmington, 1879.
Warren, Edward,	Edenton, 1859.
Warren, Thomas D.	Edenton, 1858.
Warren, W. C.	Edenton, 1852, 58 v.p.
Webb, William,	Hillsborough, 1850. (d.)
Wood, Thomas F.	Wilmington, 1879, 80.

OHIO.

Agard, Aurelius H.	Sandusky, 1863, 66, 67, 71, 75.
Allen, Dudley,	Oberlin, 1867, 76.
Allen, Peter,	Kinsman, 1859. (d.)
Alley, E. H.	Toledo, 1876.
Almy, Stephen Olney,	Cincinnati, 1863, 65, 66 V.P., 67, 69. (d. 1877.)
Armor, S. G.	Dalton, 1856, 59.
Arons, John J.	Cincinnati, 1854.
Ashton, A. S., (M.I.)	Piqua, 1867.
Austin, A.	Sandusky, 1856.
*Awl, William M.	Columbus, 1848 V.P., 49. (d. 1876.)
Ayers, Alfred,	Greenville, 1856.
Ayres, J. H.	Urbana, 1880.
Baird, James M.	Bourneville, 1850.
*Baker, Abraham H.	Cincinnati, 1850, 59. (d. 1865.)
Baker, F. H., (M.)	1852.
Baker, T. H.	Woosler, 1852, 55. (d. 1871.)
Baldwin, J. F., (M.)	Columbus, 1876.
Bartholow, Roberts,	Cincinnati, 1867, 75.
Bates, J. M.	Wausen, 1880.
Battles, W. S.	Shreve, 1855, 63, 72, 73, 76.
Baxter, Samuel A.	Lima, 1867.
Beach, W. M.	Columbus, 1880.
Beardsley, Chas. E.	Ottawa, 1874, 75, 76, 77.
Bennett, J. H.	Wausen, 1874, 76.
Bennett, John,	Cleveland, 1874, 76, 77, 80.
Bennett, Porter R.	Urbana, 1880.
Bigelow, John M.	Lancaster, 1850. (d.)
Bishop, S. P.	Delta, 1872, 74, 76, 77, 78 80.
Black, J. R.	Newark, 1877.
*Blackman, Geo. C.	Cincinnati, 1869. (d. 1871.)
*Boerstler, G. W.	Lancaster, 1850. (d. 1871.)
Bond, John W., (M.I.)	Toledo, 1854, 66.
Bonner, Stephen,	Cincinnati, 1856, 58, 59, 67. (d. 1877.)
Bonner, S. P.	Cincinnati, 1867. (d. 1873.)
Boone, A.	Dayton, 1880.
Bowers, Geo. W.	Toledo, 1874.
Brackett, A. J., (M.)	Bristolville, 1876.
Brainard, A. C.	Orangeville, 1873.
Bramble, D. D., (M I.)	Cincinnati, 1867, 80.
Branson, Smith,	Chester Hills, 1856, 67.
Brewington, W. J.	Berlin, 1874.
Briggs, James M.	Marion, 1850.
*Brown, Benjamin Stanton,	Bellefontaine, 1857, 58, 59, 67, 68, 69, 71, 72. (d. 1873.)
Brown, Joseph Clark,	Urbana, 1864, 67, 69.
Brown, Wm. T.	Cincinnati, 1867, 70, 72.
Bruehl, Gustavus,	Cincinnati, 1871.
Buckner, Jas. H.	Cincinnati, 1864, 67, 68, 75.
Buckner, P. J.	Georgetown, 1850. (d.)
Bunce, Wm.	Oberlin, 1878, 80.
Bunker, W. H., (M.I.)	Cincinnati, 1877.
Burton, E. D.	Collamer, 1874.
Bushnell, W., (M.)	Richmond Co., 1850.
Butterfield, John,	Columbus, 1847. (d. 1847.)
Carey, Abel,	Salem, 1855, 56, 58, 64, 65. (d. 1872.)
Carey, H. G.	Dayton, 1850, 56, 59.
Carpenter, Julia W.	Cincinnati, 1880.

Carrick, A. L.	Cincinnati, 1867.
Carroll, Thomas,	Cincinnati, 1850, 64, 67. (d. 1871.)
Carson, Wm.	Cincinnati, 1850, 67, 72, 73, 75.
Carter, Francis,	Columbus, 1850.
Chapman, Chandler, (M.)	Cincinnati, 1867.
Chapman, W. C.	Toledo, 1877.
Charters, W. M.	Lebanon, 1850.
Chase, B. S.	Akron, 1875, 76. (d. 1878.)
Chesney, William Mahon,	Kenton, 1869.
Child, H. H., (M.)	Columbus, 1849. (d. 1868.)
Clements, Joshua,	Dayton, 1854, 56, 59.
Clendenin, Wm.	Cincinnati, 1854, 55, 56, 73.
Cochran, Charles,	Sandusky, 1856, 67.
Colton, J. D., (M.I.)	1850.
Combs, John G., (M.)	1867.
Comegys, Cornelius G.	Cincinnati, 1853, 55, 58, 59, 67, 68, 72, 73, 75, 77.
Conklin, H. Smith,	Sidney, 1850.
Conklin, S. A.	Canton, 1874, 76, 80.
Conklin, W. J.	Dayton, 1878, 80.
Conner, P. S.	Cincinnati, 1867, 75.
Cook, Jesse W., (M.I.)	1850. (d.)
Cooney, Hervey,	Bryan, 1877.
Coons, Israel A.	Middletown, 1854, 67.
Corson, John, (M.)	Middletown, 1872.
Corson, Joseph,	Portsmouth, 1850.
Cotton, D. B.	Portsmouth, 1859, 71.
Cotton, J. D.	Marietta, 1853, 55, 67.
Cox, D. A.	New Paris, 1850. (d.)
Craig, J. W.	Mansfield, 1878, 80.
Crane, Israel L.	Ashland, 1860.
Crews, James H.	Upshur, 1850.
Crune, Pliney M.	Eaton, 1850, 58. (d. 1869.)
Crumm, E. C.	Dayton, 1880.
Culbertson, H.	Zanesville, 1872, 77, 80.
Cushing, H. K.	Cleveland, 1878.
Cuykendall, M. C.	Bucyrus, 1876, 78.
Davis, E. H.	Chillicothe, 1850.
Davis, John,	Cincinnati, 1850, 59, 67.
Davis, W. B., (M.I.)	Cincinnati, 1859, 63, 67.
*Dawson, John, (M.I.)	Columbus, 1850, 55, 58. (d. 1866.)
Dawson, W. W.	Cincinnati, 1859, 67, 75, 79, 80.
De Lamater, J. J.	Cleveland, 1848, 53, 60. (d. 1867.)
Denig, Robert M.	Columbus, 1864, 71.
Denise, J. C.	Dayton, 1859.
Dodge, J. S., (E.P.M.)	Cincinnati, 1850, 67. (d. 1872.)
Doherty, G. A.	Cincinnati, 1859, 64, 65, 67. (d. 1869.)
Donahue, Henry James,	Sandusky, 1856, 58, 69, 70, 71, 74, 76, 78.
Dorsey, G. Volney,	Piqua, 1856.
Douglass, W. W.	Toledo, 1874.
Drake, Daniel, (E.P.M.)	Cincinnati, 1850, 51, 52. (d. 1852.)
Drake, J. S., (M.)	Lebanon, 1850.
Dumm, S. C.	Constantine, 1880.
Duncan, James A.	Toledo, 1876.
Dunlap, Alexander,	Springfield, 1855, 67, 68, 73, 74, 75, 76, 77, 78 V.P.
Dunlap, A. S.	Dayton, 1875.
Dunlap, Charles W.	Springfield, 1872.
Dunton, O., (M.)	1867.
Dutton, C. F., (M.)	Cleveland, 1877.

Eames, J., (M.I.)	Salem, 1856.
Eaton, T. J.	Toledo, 1850, 67.
Edwards, T. O.	Cincinnati, 1850.
Effinger, M.	Lancaster, 1850.
Ellsbury, W. W.	Georgetown, 1850, 75.
Elsten, W. P.	Columbus, 1867. (d. 1872.)
Erwin, A. J.	Mansfield, 1874, 75, 77.
Evans, Asbury,	Cincinnati, 1855. (d. 1875.)
Evans, Atho, Jr.,	Franklin, 1867.
Evans, R. P.	Franklin, 1867.
Everhard, N. S.	Wadsworth, 1874, 80.
Falconer, Cyrus,	Hamilton, 1850, 67, 79.
Ferris, O., (M.I.)	1857.
Ferris, Samuel,	New Westville, 1850.
Finch, C. M.	Portsmouth, 1868.
Firestone, John L.	Wooster, 1880.
Firestone, Leander,	Columbus, 1877.
Firman, F. W.	Findley, 1875, 76.
Fisher, Elias,	Waynesville, 1850.
Follett, Alfred,	Granville, 1872.
Foote, H. E.	Cincinnati, 1859, 67. (d. 1872.)
Forbes, Samuel F.	Toledo, 1874, 75, 77.
Ford, James B.	Norwalk, 1860.
Ford, Prior G.	Cincinnati, 1850. (d. 1872.)
Foster, Thomas, (M.)	1850.
Foulke, L. W.	Chillicothe, 1876.
*Fries, George,	Hanovertown, 1848, 50, 59, 64, 66. (d. 1866.)
Fyffe, E. P.	Urbana, 1858, 59. (d. 1867.)
Gard, J. N.	Greenville, 1856.
Gaston, Ephraim,	Morristown, 1848, 50, 55. (d. 1868.)
Gerve, F. H. J.	Cincinnati, 1867.
Gilcrist, Robert S.	De Graff, 1858, 71, 74.
Gillett, B.	Springfield, 1850.
Gobrecht, Wm. H.	Cincinnati, 1867, 72, 76.
Goddard, J. W.	Urbana, 1867.
Gordon, G. E.	Georgetown, 1867.
Gordon, Thomas W.	Georgetown, 1853, 55, 56, 59, 75.
Graff, Milton B.	Cincinnati, 1865, 66, 67. (d. 1875.)
*Graham, James,	Cincinnati, 1859, 67. (d. 1879.)
Grant, Charles,	Cincinnati, 1850, 54.
Gray, S. S., (M.I.)	Piqua, 1867, 73.
Green, J. H.	Troy, 1876,
Griswold, L. D.	Elyra, 1856.
Griswold, Wayne, (M.I.)	Circleville, 1849, 67.
Gundry, Richard,	Dayton, 1856, 67.
Hall, W. C., (M.I.)	Fayetteville, 1859. (d. 1872.)
Hall, W. C., (E.P.M.)	Keystone Farm, 1863, 67. (d. 1876.)
Hamilton, J. W.	Columbus, 1864, 67, 80.
Hancock, Alf.	Millville, 1875.
Harrison, Eugene B., (M.I.)	Napoleon, 1867, 74, 76, 77, 78, 80.
*Harrison, John P.	Cincinnati, 1848, 49 V.P. (d. 1849.)
Hart, Benj. F., (M.I.)	Marietta, 1867, 72, 73.
Hart, Galen, (M.I.)	1867.
Hart, Seth, (M.I.)	1850.
Heighway, A. E.	Cincinnati, 1858, 59, 65, 66, 68, 69, 70, 71, 72, 73, 74, 76, 77, 78, 79, 80.
Helmick, Joseph,	Harrisburg, 1859, 69, 70, 76.
Hempstead, G. S. B., (M.)	1850.
Henderson, James P.	Newville, 1856, 74, 75, 76, 77, 78.
Herrick, Henry J.	Cleveland, 1877, 80.

Hetrick, A. B.	Georgetown, 1850.
Hildreth, Charles C.	Zanesville, 1866, 72, 76.
Hill, E. L.	Oxford, 1867.
Hill, L. S.	Neville, 1867.
Hills, R.	Delaware, 1850, 55, 56. (d. 1879.)
Hines, Isaac N.	Cleveland, 1876, 77.
Hoeltze, A.	Cincinnati, 1875.
Holston, John G. F.	Zanesville, 1855, 58, 67. (d.)
Holston, J. G. F., Jr.,	Zanesville, 1872.
Hough, J. B.	Waynesville, 1873.
Hovey, Ariel B.	Tiffin City, 1871.
Howard, E. W.	Akron, 1870.
Howard, H. C.	Akron, 1876.
Howard, R. L.	Columbus, 1848, 50, 53 V.P. (d. 1853.)
Hudson, Salmon,	Medina, 1874, 77, 78, 80.
Huestis, Isaac,	Chester Hills, 1856, 58, 67.
Hughes, C. B.	Cincinnati, 1854.
Hughes, W. K. (M.I.)	Cleveland, 1870.
Hunt, Samuel P.	Morrow, 1850, 59.
Hunt, W. S.	Terre Haute, 1880.
Hurd, A.	Findlay, 1874, 76.
Hurxthal, Frederick T.	Masselon, 1856. (d. 1863.)
Hyatt, E. H.	Delaware, 1875.
Irvine, J. S., (M.I.)	1850.
Jacobs, W. C.	Akron, 1875, 76.
James, L. A., (M.I.)	Cincinnati, 1868.
Jennings, Ellis,	Dayton, 1867.
Jennings, J. D.	Sonora, 1872.
Jewett, Adams,	Dayton, 1874. (d. 1875.)
Johnson, B. P.	Alliance, 1872.
Johnston, Alex. M.	Cincinnati, 1855. (d. 1870.)
*Jones, Andrew Barry,	Portsmouth, 1868, 70, 71. (d. 1876.)
Jones, Caleb, (M.I.)	1855.
Jones, John E.	Cincinnati, 1867.
Jones, N. E.	Circleville, 1878.
Jones, Philo E.	Wauseon, 1873, 74, 77.
Jones, Wm.	Kenton, 1867, 76.
Jones, W. W.	Toledo, 1856, 63, 64, 67, 70, 73, 74, 77, 78.
Judkins, David,	Cincinnati, 1847, 50.
Judkins, Jesse P.	Cincinnati, 1850, 51, 53, 58, 59. (d.)
Judkins, M. W., (M.)	Belair, 1867, 70, 72.
Judkins, Wm.,	Cincinnati, 1848, 50, 76, 78, (d.)
Kable, W. R.	Bellbrook, 1858, 59. (d. 1859.)
Kearney, Thos. H.	Cincinnati, 1867, 78.
Kelly, P. H.	Waterford, 1859.
Kemp, J. D.	Vandalia, 1866.
Kendrick, Elijah, (M.)	Hamilton Co., 1850.
Kendrick, Oscar C.	Newbury, 1860.
Kennedy, J. C.	Batavia, 1867.
Kennedy, Philip,	Deavertown, 1872.
Keyt, A. T.	Walnut Hills, 1874, 75, 76.
Kincaid, W. P.	New Richmond, 1859, 67.
*Koehne, H. F.	Dayton, 1857. (d. 1858.)
Knapp, Isaac, (M.I.)	1850.
Kreider, C. L.	Monroeville, 1876.
Kreider, M. Z.	Lancaster, 1848, 50. (d. 1852.)
Krout, A. N.	Van Wert, 1874.
Kyle, John G.	Xenia, 1858, 67. (d. 1870.)
Lair, John A.	Portsmouth, 1867.
Lamme, W. H.	Xenia, 1859.

Landfear, L. R.	Dayton, 1877.
Lane, E. S.	Sandusky, 1850, 52.
Langdon, Oliver M.	Cincinnati, 1850, 54, 71, 73, 74, 75. (d. 1878.)
Larimer, Frank C.	Mount Vernon, 1872, 74.
Lawson, B. S.	Cincinnati, 1852.
Lawson, L. M., (E.P.M)	Cincinnati, 1850, 63. (d.)
Lecklider, L. G.	Ansonia, 1859.
Leighton, Usher Parsons,	Kenton, 1859.
Leonard, B. B.	West Liberty, 1855, 64, 67, 72, 74.
Leonard, C. S., (M.)	Portage Co., 1877.
Little, John A.	Delaware, 1872. (d. 1877.)
Locke, John,	Cincinnati, 1850. (d. 1852.)
Long, J. W.	Byron, 1874, 78.
Longfellow, A. J.	Fostoria, 1870, 76.
Loving, Starling,	Columbus, 1876, 77, 79.
Lyman, O. N.	Wadsworth, 1874.
Lynch, Elijah,	Greensville, 1867.
McArthur, J. W.	Wilmington, 1855.
McAvoy, W. B.	Franklin, 1867.
McCollum, E. J., (M.)	Tiffin, 1877.
McConnelly, F. C.	Vermilion, 1877.
McCoskey, H.	Felicity, 1867.
McDermott, C.	Dayton, 1856, 59, 63, 67, 77.
*McDowell, W. J.	Portsmouth, 1867, 71, 73. (d. 1878.)
McElright, Thomas G.	Akron, 1867, 74, 75.
McFarland, J. A.	Tiffin City, 1857, 71.
McGrew, John S.	Cincinnati, 1850.
McIlvaine, Robert R.	Cincinnati, 1850, 54, 68.
McLaughlin, A. C.	Tremont City, 1872, 73, 74, 75, 78.
McLean, R. G.	Lockbourne, 1867. (d. 1877.)
McMeens, R. R.	Sandusky, 1855, 56, 58, 59. (d. 1864.)
McMillan, Alex.	Springfield, 1876.
McMillan, W. L.	Columbus, 1858.
McNally, Thomas,	Chillicothe, 1850.
Mack, H. O.	Shelby, 1856.
Macready, James,	Monroe, 1875.
McReynolds, W. H.	Cincinnati, 1867.
Magguin, J. C.	Fayetteville, 1856.
Maley, P. F., (M.I.)	Cincinnati, 1867.
Martin, Joshua,	Xenia, 1850. (d.)
Matson, A. F., (M.)	Logansville, 1858.
Matthews, W. S.	Youngstown, 1874, 76, 77.
Mead, Edw.	Cincinnati, 1867.
*Mendenhall, George,	Cincinnati, 1850, 51, 54, 56, 58, 59, 64, 66, 67, 68, 69 V.P., 70 P., 71, 72. (d. 1874.)
Mendenhall, J. W., (M.)	Cincinnati, 1867.
Miller, A. C., (E.P.M.)	Cleveland, 1877.
Minor, Thomas C.	Cincinnati, 1872.
Mitchell, George,	Mansfield, 1873.
Mitchell, Geo. F.	Mansfield, 1856, 68. (d. 1869.)
Moe, L. W.	Ottawa, 1875.
Moore, Wm.	New Lisbon, 1878, 80.
Morris, Florillo B., (M.)	Butler Co., 1872.
Morris, Jonathan,	Ironton, 1878, 79.
Morse, D. A.	London, 1876.
Mortland, J. C.	Edgarton, 1874.
Mosgrove, Adam,	Urbanna, 1856, 58. (d.)
Mosgrove, James M.	Urbanna, 1857, 67.
Mosgrove, S. M.	1880.

Mount, W.	Cincinnati, 1859.
Moxley, N. K.	Ironton, 1850.
Moxley, Thomas S.	Wheelersburg, 1850.
Mullen, T. J.	New Richmond, 1859, 67.
Munson, A. W.	Kenton, 1856, 57, 67, 72.
Murphy, John A.	Cincinnati, 1853, 59, 60, 67, 68, 70, 73, 74, 75, 77, 79.
Murray, L. S.	Medina, 1874.
Murray, Robert D., (M.I.)	Cleveland, 1870.
Muscroft, C. S.	Cincinnati, 1867, 75, 78.
Musgrave, H. B.	Cincinnati, 1854.
Mussey, F. B.	Cincinnati, 1850. (d. 1876.)
Mussey, Reuben D.	Cincinnati, 1849, 50 P., 51, 52, 53, 54, 55, 56, 60. (d. 1865.)
Mussey, Wm. H.	Cincinnati, 1858, 60 V.P., 64 V.P., 67, 68, 69, 70, 72, 73, 75, 78, 79.
Nagle, J. E., (M.)	1854.
Nardyz, M. L.,	Cincinnati, 1872, 74.
Neal, Thomas L.	Dayton, 1866, 68, 72, 74, 76, 80.
Neff, B.	New Carlisle, 1856.
Neidermyer, H.	Cincinnati, 1875.
Norton, J. C.	Marion, 1850. (d.)
Norton, Oliver D.	Cincinnati, 1855, 65, 66, 68, 72, 75, 77.
Noyes, Hiram J.	Meigsville, 1876.
Odell, S. T.	Akron, 1875.
Palmer, C. D.	Cincinnati, 1867.
Parvin, Theophilus,	Cincinnati, 1867, 69.
Patterson, A. V.	Mansfield, 1880.
Paul, T. E.	Ottawa, 1875.
Pearce, Enoch, Jr., (M.I.)	Steubenville, 1868.
Pearce, H. A., (M.I.)	Urbanna, 1878.
Pearce, H. C.	Urbanna, 1878, 80.
Pease, Leavitt T.	Williamsburg, 1867, 69.
Phillips, W. H.	Kenton, 1856, 72.
Pomerene, P. P.	Berlin, 1878.
Potter, J. F.	Cincinnati, 1855, 67. (d. 1868.)
Proctor, George M.	Shalersville, 1878.
Querner, L. A.	Cincinnati, 1872.
Quinn, J. J.	Cincinnati, 1875.
Rankin, A. H.	Sandusky, 1872.
Raschig, W.	Cincinnati, 1872.
Raymond, Charles H.	Cincinnati, 1850, 53.
Rea, R. L.	Cincinnati, 1859.
Read, Albert N.	Norwalk, 1867, 74, 80.
Read, R. C. S., (M.)	Cincinnati, 1867.
Reamy, Thaddeus A.	Cincinnati, 1867, 70, 73, 75, 77, 78.
Reed, A. M., (M.I.)	Norwalk, 1855.
Reed, T. J.	Massillon, 1878, 80.
Reeve, J. C.	Dayton, 1866, 67, 68, 78, 80.
Richards, Wolcott, (E.P.M.)	Cincinnati, 1850, 53. (d. 1873.)
Richardson, B. F.	Cincinnati, 1859, 67.
Ridenour, Albert W.	Massillon, 1877, 78, 80.
Ridenour, W. T.	Toledo, 1874, 76.
Rigdon, L., (M.)	Hamilton, 1850. (d. 1865.)
Rives, L. C.	Cincinnati, 1850, 56. (d. 1869.)
Robb, Andrew,	Blanchester, 1867.
Robertson, C.	McConnellsville, 1856.
Robinson, Jas. D.	Wooster, 1850, 54, 65, 72, 78, 80.
Robinson, Jos., (M.I.)	1856.
Rogers, J. G.	New Richmond, 1858, 59, 67
Rosenfield, Albert,	Cincinnati, 1868, 75.

Russell, John W.	Mount Vernon, 1860, 67, 70, 71, 72, 74, 78.
Sachse, G. I.	Columbus, 1850. (d.)
Safford, Robert.	Putnam, 1850.
Sams, C. C., (M.I.)	Hillsboro', 1850, 52. (d. 1865.)
Sanders, R. M., (M.)	1867.
Sayles, J. A.	Cleveland, 1856.
Scarff, W. D.	Belfontaine, 1858, 67, 73.
Schenck, C. F.	Columbus, 1850.
Schenck, W. L.	Franklin, 1856, 59, 67.
Schnetzler, H. M.	Toledo, 1874, 76.
Scott, W. J.	Cleveland, 1876, 77, 78.
Scott, Xenophon C.	Cleveland, 1874, 75, 77, 78, 80.
Selden, O. G.	Shanonsville, 1870.
Senseman, Hiram,	Tremont, 1872, 73, 74.
Severance, R. A.	Belleview, 1867.
Sheets, Levi D.	Dayton, 1855.
Sheldon, B.	Cleveland, 1856.
Sherman, A. M.	Kent, 1880.
Shiveley, J. W.	Kent, 1871.
Shoemaker, J. M.	Napoleon, 1874, 76.
Shotwell, John T.	Cincinnati, 1850. (d. 1850.)
Silby, E. H.	Medina, 1856.
Sinneth, E.	Granville, 1868.
Skinner, C. J.	Somerset, 1872.
Skinner, J. A., (M.I.)	1850.
Slocum, Charles E., (M.I.)	Defiance, 1874, 75, 76.
Slusser, Lewis,	Canton, 1856, 74.
Smith, Amos C.	Medina, 1854. (d. 1861.)
Smith, Edwin,	Dayton, 1850.
Smith, Harvey W.	Mount Vernon, 1870. (d. 1874.)
Smith, John A.	Piqua, 1856.
Smith, J. B.	Cincinnati, 1858, 59. (d. 1867.)
Smith, S. Hanbury,	Columbus, 1850, 53.
Smith, S. M.	Columbus, 1848, 54, 55. (d.)
Smith, Wm.	Van Wort, 1877.
Soule, N. E., (M.)	Cincinnati, 1853.
Speece, N. V.	Quincy, Ill., 1880.
Spillman, Henry,	Medina, 1856, 58. (d. 1862.)
Stabler, J. D., (M.I.)	Cincinnati, 1867.
Stanley, Edward,	Sandusky, 1871, 74.
Stanton, Benjamin, (M.I)	Salina, 1856. (d. 1861.)
Steele, H. K.	Dayton, 1850, 67.
Stemen, C. B., (M.)	Fort Wayne, Ind., 1877.
Stevens, E. B.	Cincinnati, 1859, 67.
Stevens, Joshua,	Lebanon, 1850.
Stevens, M. B.	Defiance, 1878.
Stewart, Thos. H.	Church Hill, 1856, 78, 80.
Stoll, J. H., (M.)	Marshallville, 1877.
Strader, D. P.	Cincinnati, 1850.
Surrel, E., (M.)	1867.
Sweeney, R. L.	Marion, 1867.
Sykes, W. H.	Plymouth, 1874.
Tacker, L. G., (E.P.M.)	Defiance, 1878.
Taggart, Thomas M.	Dalton, 1859.
Taggarts, W. W.	Smithville, 1854.
Taggert, J. M.	Dalton, 1863.
Taliaferro, W. I.	Cincinnati, 1850, 54, 67. (d. 1871.)
Tappan, Benjamin,	Steubenville, 1856. (d.)
Taylor, James,	Cincinnati, 1850.
Taylor, W. H.	Cincinnati, 1867.

Thomas, K. G.	Alliance, 1863, 64. (d. 1869.)
*Thomas, Wm.	Bellfont, 1868, 71. (d. 1875.)
Thompson, J. B.	Columbus, 1850.
*Thompson, Robert,	Columbus, 1850, 59, 60, 64. (d. 1865.)
Thorn, Samuel S.	Toledo, 1874.
Thornton, W. P., (M.)	Cincinnati, 1867.
Tilden, Daniel,	Sandusky, 1850, 51, 52, 53, 55, 56, 59. (d. 1870.)
Todd, Joseph Henry,	Wooster, 1869.
Townsend, John H.	Holgate, 1867, 69, 73, 74, 77, 78, 80.
Tressel, J. H., (X.)	Alliance, 1877.
Trevitt, Wm.	Columbus, 1850, 56.
Tucker, J. M., (M.)	Cincinnati, 1873.
*Turney, Samuel D., (M.)	Circleville, 1877. (d. 1878.)
Tweed, T. M.	Eckmansville, 1850.
Underhill, J. W.	Cincinnati, 1875, 77.
Underwood, W. J.	Akron, 1880.
Unzicher, J. S., (M.)	Cincinnati, 1867. (d. 1876.)
Updegraff, J. T.	Mount Pleasant, 1854.
Vance, Reuben A.	Gallipolis, 1874.
Van Harlengen, John,	Lebanon, 1850.
Vattier, John L.	Cincinnati, 1850, 58.
*Waddl, Thomas,	Toledo, 1877, 78. (d. 1879.)
Walker, J. P.	Cincinnati, 1855, 65, 66, 68, 72.
Walker, J. R.	Wilmington, 1867.
Warder, John A., (M.I.)	Cincinnati, 1867.
Waterman, L. D.	Cincinnati, 1854.
Webb, J. D., (M.)	Cincinnati, 1868. (d. 1880.)
Weber, G. C. E.	Cleveland, 1859, 67.
Weirich, Israel,	Martins Ferry, 1870.
West, Henry,	Clairsville, 1850, 70.
West, S. B.	Martins Ferry, 1870.
Westbrook, A. E.	Ashley, 1876, 79.
White, James,	Lancaster, 1850.
White, John, (M.I.)	1850.
White, John F.	Cincinnati, 1848, 50, 67.
White, J. W., (X.)	Stockport, 1856.
Whiting, A. W.	Newburg, 1859.
Williams, Amos S.	Fostoria, 1867, 73.
Williams, E.	Cincinnati, 1865, 67, 79.
Williams, Isaac C.	Bloomington, 1855. (d. 1868.)
Williams, L. G.	Fostoria, 1878.
Wilson, C. P.	Cincinnati, 1867.
Wilson, E. J.	Mt. Vernon, 1880.
Wilson, H.	Demos, 1848.
Wilson, James Fulton,	Youngstown, 1877.
Wilson, M. D.	Belle Centre, 1880.
Wood, Thomas,	Cincinnati, 1855, 67, 79.
Woodbridge, J. Elliott,	Youngstown, 1874, 76, 78, 80.
Woods, J. K.	Mendon, 1872.
Woods, J. T.	Toledo, 1874.
Woodward, Charles,	Cincinnati, 1850, 67, 70. (d. 1874.)
Wormly, Theo G.	Columbus, 1864, 67.
Worthington, Lewis S.	Cincinnati, 1872.
Wright, A., (M.I.)	Springboro, 1867.
Wright, C. W., (M.)	Cincinnati, 1852.
Wright, James D.	Belmont, 1850.
*Wright, M. B.	Cincinnati, 1850, 54, 66, 67, 68, 75. (d. 1879.)
Wylie, A. N.	Ripley, 1867, 70.

OREGON.

Belt, A. M.	Salem, 1871.
Carpenter, Horace,	Salem, 1870, 71.
Holmes, H. R.	Salem, 1880.
*Logan, Thomas M.	Williamette Univ., 1872 P. (d. 1876.)
Payton, Daniel,	Salem, 1871.
Warriner, W. C.	Salem, 1871.

PENNSYLVANIA.

Agnew, D. Hays,	Philadelphia, 1872, 80.
Alba, E. M.	Williamsport, 1874.
Albright, Fred. G.	Lancaster, 1876, 80.
Allen, Ezra P.	Athens, 1860, 64, 72, 73, 74, 76, 78.
Allen, Harrison,	Philadelphia, 1872, 80.
Allen, J. M.	Philadelphia, 1852, 53, 55.
Allen, Joshua G.	Philadelphia, 1872, 75, 76.
Anawalt, J. W.	Greensburg, 1872, 76, 80.
Anderson, Wm.	Indiana, 1868, 76, 78.
Andrews, James P.	Lancaster, 1849.
Asdale, William James,	Pittsburg, 1869, 71, 73, 74, 80.
Ash, Henry St. Clair,	Philadelphia, 1864, 65, 66, 72, 77.
Ashhurst, John,	Philadelphia, 1872.
Ashhurst, Samuel,	Philadelphia, 1872.
Ashmead, William,	Philadelphia, 1847, 48, 53, 55.
Atkinson, Wm. Biddle,	Philadelphia, 1859, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80.
Atlee, John L.	Lancaster, 1847, 48, 49, 51, 52, 53, 54, 55, 56, 58, 60, 66, 67, 68 V.P., 70, 72, 76, 80.
*Atlee, Washington L.	Philadelphia, 1846, 47, 55, 58, 66, 67, 68 V.P., 70, 71, 72, 73, 74, 75, 76, 77. (d. 1878.)
*Bache, Franklin,	Philadelphia, 1847, 55. (d. 1864.)
Bache, T. Hewson,	Philadelphia, 1855, 58.
Baker, Charles L.	Lancaster, 1847. (d. 1859.)
Baldwin, L. K.	Philadelphia, 1876.
Bare, A. S.	Lancaster, 1850. (d.)
Barr, George W.	Titusville, 1868, 72, 77, 78.
Barton, J. M.	Philadelphia, 1872, 76, 78.
Baskin, George W.	Mercer, 1850. (d.)
Bates, S. S.	Titusville, 1868. (d. 1873.)
Baxter, H. F.	Philadelphia, 1880.
Beaver, David R.	Conshohocken, 1876.
Beaver, D. Lewellyn,	Reading, 1860, 64.
Beck, ——, (M.I.)	1852.
Bell, John,	Philadelphia, 1846, 47, 48, 54. (d. 1872.)
Bell, John B.	Philadelphia, 1854.
Benham, Silas N.	Pittsburg, 1868, 73, 74, 75, 76, 77, 78, 79, 80.
Bennett, Geo. C.	Erie, 1867. (d. 1873.)
Berntheisel, G. W.	Lancaster, 1880.
Benton, S. H.	Oil City, 1876, 78, 80.
Bertolet, P. G.	Olney, 1855, 56, 60. (d.)
Bertolet, R. M., (M.)	Philadelphia, 1873. (d.)
Best, David,	Meadville, 1867, 74, 76.

Betton, Thomas F.	Germantown, 1849, 51, 53, 55. (d.)
Bibighaus, C. H.	Philadelphia, 1850, 52, 53. (d. 1854.)
*Biddle, John B.	Philadelphia, 1848, 53, 54, 55, 58, 76, 77, 78. (d. 1879.)
Biddle, J. C.	Shenandoah, 1880.
Bird, J. F.	Philadelphia, 1855.
Blachly, S. L.	Sparta, 1874, 76, 77.
Blackwood, W. R. D.	Philadelphia, 1878, 80.
Blair, A. R., (M.I.)	York, 1858, 80.
Blakeslee, A. C.	Dunocks, 1860.
Bland, D. W.	Pottsville, 1876, 80.
Blatchly, O. L.	Sparta, 1880.
Bockius, S. Atlee,	Columbia, 1876.
Boisnot, James M.	Philadelphia, 1865. (d. 1879.)
Boker, Charles S.	Philadelphia, 1864, 66, 72.
Bolles, Lucius S.	Philadelphia, 1872. (d. 1873.)
Bolling, Robert, (M.I.)	Philadelphia, 1875.
Bond, Henry,	Philadelphia, 1846, 47, 48, 49, 53, 55. (d. 1859.)
Bonebreak, D. W.	Martinsburg, 1880.
Bonsteel, A. S.	Corry, 1878.
Burnonville, Aug. C.	Philadelphia, 1876.
Bradley, Melissa H.	Wilkes-Barre, 1878. (d. 1878.)
Brallier, E.	Chambersburg, 1876.
Brandt, E. B.	Mechanicsburg, 1872.
Bredin, Stephen,	Butler, 1872.
Brehman, G. Edmund,	Altoona, 1870, 74.
Breinig, P. B.	Bethlehem, 1865, 66, 68, 76, 80.
Breitenbach, Jeremiah,	Myerstown, 1847.
Bridges, Robert,	Philadelphia, 1847.
Brinton, John B.	Philadelphia, 1853, 58, 60, 70, 72.
Brinton, John H., (M.)	Philadelphia, 1872, 80.
Brinton, W. B.	Westchester, 1868.
Brown, Charles W.	Mansfield, 1876.
Brown, G. W.	Port Carbon, 1876, 80.
Brown, H. J.	Philadelphia, 1847.
Brown, R. B.	Summerville, 1880.
Bruce, Geo. D.	Pittsburg, 1876.
Bruen, Edward Tunis,	Philadelphia, 1880.
Brumbaugh, A. B.	Huntingdon, 1872, 76.
Brundage, A. T.	Factoryville, 1880.
Bruner, D. J.	Columbia, 1871, 72.
Bryan, James,	Philadelphia, 1848, 49, 53, 55, 58, 59, 60. (d.)
Bryan, Joseph R.	Philadelphia, 1847. (d.)
Buck, Frederick J.	Philadelphia, 1874, 75, 76.
Bulkeley, J. E.	Wilkes-Barre, 1872, 76, 80.
Burden, Isaac R.	Philadelphia, 1847, 48, 58. (d.)
Burns, Robert,	Philadelphia, 1865, 66, 68, 70, 72, 78.
Burpee, David,	Philadelphia, 1872, 76.
Burr, Chas.	Carbondale, 1876.
Burrows, Francis S.	Lancaster, 1848, 49, 50, 51, 52, 53. (d.)
Butler, Samuel W.	Philadelphia, 1860, 64, 66, 67, 70, 72. (d. 1874.)
Buttermore, Smith,	Connellsville, 1874, 76, 77, 79.
Calvin, D. M.	Meadville, 1870, 72, 73, 75, 76.
Carpenter, Henry,	Lancaster, 1847, 53, 55, 56, 58, 70, 80.
Carpenter, James S.	Pottsville, 1849, 53, 55, 58, 60, 66, 68. (d. 1872.)
Carpenter, John T.	Pottsville, 1867, 70, 78, 80.

Carson, Joseph,	Philadelphia, 1847, 51, 52, 53, 54, 55, 58. (d.)
Carter, Charles,	Philadelphia, 1872, 76.
Cassiday, Patrick,	Lancaster, 1853, 54, 55, 56, 57, 58. (d. 1865.)
Chapman, Nathaniel,	Philadelphia, 1847 P., 48. (d. 1853.)
Chessrown, A. V.	Pittsburg, 1878.
Cheston, D. Murray,	Philadelphia, 1866, 69, 72.
Christie, L. H.	Petroleum Centre, 1872.
Christy, R. W.	Hollidaysburg, 1872.
Clark, Anson T.	Worth, 1877, 78.
Clark, D. D.	Philadelphia, 1859. (d. 1874.)
Clark, Leonaida S.	Philadelphia, 1880.
Clark, Rowan,	Antistown, 1867, 80.
Clarkson, Jos. S., (M.)	Lancaster, 1848.
Cleeman, Richard A.	Philadelphia, 1872, 74, 79, 80.
Clover, Wm. M., (M.)	Lamartine, Clarion Co., 1872.
Clymer, Meredith,	Philadelphia, 1846, 48, 49.
Coad, Jos. R.	Philadelphia, 1865. (d. 1868.)
Coates, B. Horner	Philadelphia, 1847, 53, 55.
Coblentz, Jos.	Reading, 1872, 76.
Coffey, Henry T.	Pittsburg, 1866, 76.
Cohen, J. Solis,	Philadelphia, 1864, 65, 66, 70, 72, 76, 80.
Collins, Benj. M.	Doylestown, 1864, 65, 66, 68.
Collins, James,	Philadelphia, 1868, 70, 72.
Condie, D. Francis,	Philadelphia, 1847, 48, 49, 52, 53, 55, 58, 68. (d. 1875.)
Confer, J. M.	Fostoria, 1855.
Conklin, Gustavus,	Orwell, 1874.
Conklin, S. A., (M.)	Fayette Co., 1873.
Conroy, John,	Manayunk, 1855. (d.)
Coope, A. F.	Oil City, 1880.
Coover, E. H.	Harrisburg, 1877, 78, 80.
Corbit, Wm. B.	Philadelphia, 1870.
Corse, James M.	Philadelphia, 1855, 58, 65. (d.)
Corson, Ellwood M.	Norristown, 1878.
Corson, Hiram,	Plymouth Meeting, 1847, 53, 55, 58, 70, 72, 76.
Corson, Wm.	Norristown, 1854, 55, 72, 76.
Cotton, John C.	Meadville, 1867, 74.
Cowan, Frank.	Greensburg, 1874, 76.
Cox, John Redman, (M.I.)	Philadelphia, 1847.
Craig, Alex.	Columbia, 1870, 72, 73.
Crawford, J. B.	Wilkes-Barre, 1872.
Crawford, J. K.	Cooperstown, 1876.
Crawford, J. S.	Williamsport, 1872, 74, 78. (d. 1879.)
Crawford, Robert,	Cooperstown, 1870, 73.
Cummiskey, James,	Philadelphia, 1860, 64, 65.
Cunningham, Oliver,	Beaver, 1858. (d. 1860.)
Curtin, Roland G.	Philadelphia, 1872, 80.
Curtis, Levi,	Philadelphia, 1855, 72.
Curwen, John,	Harrisburg, 1870, 71, 72, 77.
Da Costa, Jacob M.	Philadelphia, 1855, 58, 64, 72, 76.
Dale, W. W.	Carlisle, 1876.
Daly, Wm. H.	Pittsburg, 1868, 72, 76, 80.
*Darlington, W.	Westchester, 1851. (d. 1863.)
Davis, I. P.	Allentown, 1876.
Davis, S. T.	Millerstown, 1870.
Day, Alfred,*	Mechanicsburg, 1874.
Deal, Lemuel J.	Philadelphia, 1868, 70, 72.
De La Cossett, H.	Greenville, 1872.

Dennis, W. F.	Wilkes-Barre, 1872. (d.)
Detwiler, B. H.	Williamsport, 1866, 70.
De Witt, Benj., (M.I.)	1864.
Dilworth, Samuel,	Pittsburg, 1850. (d.)
Dock, George,	Harrisburg, 1866.
Dorn, S. B.	St. Petersburg, 1878.
Dorsey, John H.	Huntingdon, 1855.
Drake, E. G.	Morris Run, 1876.
*Drayton, Henry E.	Philadelphia, 1851. (d. 1862.)
Drysdale, Thomas M.	Philadelphia, 1873, 75, 76, 80.
Duer, Edw. L.	Philadelphia, 1872.
Duffield, Samuel,	Lancaster, 1847, 48, 49, 50. (d.)
Duhring, Louis A.	Philadelphia, 1872, 76, 77, 80.
Dulles, C. W.	Philadelphia, 1880.
Duncan, Robert,	Lancaster, 1855.
Duncan, Wm. S.	Brownsville, 1870, 71, 74, 76, 78.
Dundor, A. B.	Reading, 1873.
*Dunglison, Robley,	Philadelphia, 1857. (d. 1869.)
Dunglison, Richard J.	Philadelphia, 1872, 74, 76, 77, 78, 79, 80.
Dunglison, Thomas R., (M.I.)	Philadelphia, 1877.
Dyer, Ezra,	Philadelphia, 1864, 72.
Dyer, John,	Danborough, 1855, 68.
Eagleson, D. S.	West Alexandria, 1872.
Edge, John P.	Downingtown, 1858, 65.
Egbert, T. W.	Oil City, 1872, 77.
Ehler, J. Augustus,	Lancaster, 1848, 53, 55, 58, 72, 78, 80.
Elder, Thomas A., (M.I.)	Mifflintown, 1870.
Ellmaker, Thomas,	Lancaster, 1850, 53, 55, 58.
Elmer, Henry W.	Philadelphia, 1870.
Ely, Edward,	New Hope, 1850. (d. 1860.)
Emack, F. D.	Mackville, 1880.
Emanuel, Manly,	Philadelphia, 1855, 65, 72, 76.
Emerson, Gouverneur,	Philadelphia, 1846, 47, 49, 51, 53, 55, 58. (d.)
Emlen, V.	Philadelphia, 1855.
Engleman, Jos. P.	Cherryville, 1880.
Erdman, Wm. B.	Macungie, 1880.
Eshleman, Isaac Stouffer,	Philadelphia, 1869, 72, 73, 74, 76.
Eshleman, John K.	Lancaster, 1847.
Evans, Horace Y.	Philadelphia, 1872.
Evans, Isadore Newton,	Hatborough, 1870, 72, 76.
Evans, W. C.	Erie, 1878.
Everitt, E. A.	Burlington, 1864.
Fay, John,	Altoona, 1858, 64, 68, 76.
Feicht, B.	Allegheny City, 1872.
Findley, Wm. Martin,	Altoona, 1869, 70, 71, 72, 74, 75, 76, 80.
Findley, Wm. R.	Altoona, 1855, 58, 64, 72.
Finley, S. Moore,	Harrisburg, 1872.
Fischer, Emil,	Philadelphia, 1868, 72.
*Fish, Augustine H.	Philadelphia, 1858, 64, 66, 68, 72. (d. 1872.)
Fitzgerald, J. M., (M.)	Clarion Co., 1878.
Fleming, Andrew,	Pittsburg, 1865.
Forbes, William S.	Philadelphia, 1872.
Forwood, J. F. M.	Chester, 1873, 76.
Foster, W. S.	Pittsburg, 1877, 80.
Foulke, John L.	Gwynedd, 1847, 52, 55.
Foulke, Joseph,	Buckingham, 1872.
Fox, George,	Philadelphia, 1847, 48, 49, 51, 55.
Fox, George H., (M.)	Philadelphia, 1870.

French, M. S.	Philadelphia, 1880.
Fricke, Albert,	Philadelphia, 1872. 75, 76, 77, 78, 79.
Fronefield, Charles,	Philadelphia, 1849, 50. (d.)
Fulton, Jas.	New London, 1876.
Fussell, Edwin,	Media, 1876.
Gable, J. C.	York, 1880.
Gallaher, Thomas J.	Pittsburg, 1866, 72, 77, 80.
*Gallaher, William,	Philadelphia, 1858. (d. 1860.)
Gaston, Alexander K.	Chester, 1852, 53, 55.
Gazzam, Joseph P.	Pittsburg, 1853. (d.)
Gebhard, Lewis P., (E P.M.)	Philadelphia, 1864, 66, 68, 70, 72. (d. 1873.)
Geibner, E. X.	Sandy Lake, 1874, 77, 78.
Gemmill, J. M.	Altoona, 1855, 56, 67, 72.
Gemmill, J. M., Jr.,	Tyrone, 1872.
Gerhard, J. Z.	Harrisburg, 1878.
Gerhard, W. W.	Philadelphia, 1848, 58. (d. 1872.)
Getchell, Frank H.	Philadelphia, 1870, 72.
Gibbons, Henry,	Philadelphia, 1849.
Gibson, William,	Philadelphia, 1848, 51. (d. 1868.)
Gilbert, David,	Philadelphia, 1850, 55. (d. 1868.)
Gillett, Buckland,	Franklin, 1869, 71, 72, 74, 75, 76, 78.
Gilmore, W. J.	Morehead, 1867.
Given, R. A.	Philadelphia, 1855.
Gobrecht, W. H.	Philadelphia, 1858, 60.
Goddard, Paul Beck,	Philadelphia, 1855. (d. 1866.)
Goodell, William,	Philadelphia, 1872, 76, 80.
Goodman, H. Earnest,	Philadelphia, 1872, 76, 80.
Gordon, Wm. H.	Philadelphia, 1860.
Graham, Samuel R.	Butler, 1878.
Grant, William R.	Philadelphia, 1848, 49. (d. 1852.)
*Green, James M.	Philadelphia, 1860. (d. 1871.)
Green, Traill,	Easton, 1853, 55, 65, 66, 68, 72, 76, 80.
Greenleaf, P. L., (M.)	Thompsontown, 1876. (d.)
Greenless, D. R., (M.I.)	Meadville, 1867.
Gries, Wm.	Reading, 1855.
Griffiths, A. W.	Philadelphia, 1866.
Griscom, John D.	Philadelphia, 1847, 48, 49, 50.
Griswold, Elisha.	Sharon, 1872.
Gross, Augustus H.	East Liberty, 1866, 67.
Gross, Ferdinand H.	Philadelphia, 1878.
Gross, Samuel D.	Philadelphia, 1858, 66, 67, 68 P., 70, 72, 74, 75, 76, 77, 78, 79, 80.
Gross, Samuel W.	Philadelphia, 1880.
Grouard, John Hanson,	Allegheny City, 1869, 74.
Grove, J. H.	Philadelphia, 1867, 68, 72, 76.
Gruel, Louis,	Philadelphia, 1868.
Gruyder, M. R., (M.)	Lancaster, 1853.
Guilford, Wm. Moore,	Lebanon, 1855, 58, 60.
Haines, Wm. S.	Philadelphia, 1847.
Hakes, Harry,	Wilkes-Barre, 1880.
Halberstadt, A. H.	Pottsville, 1860, 72, 76, 77, 78, 80.
Halberstadt, George,	Pottsville, 1855. (d.)
Hale, George, Jr.,	Philadelphia, 1872.
Hall, A. Douglass,	Philadelphia, 1872, 76.
Hallowell, Edward,	Philadelphia, 1849, 51. (d.)
Halsey, Calvin C.	Montrose, 1864.
Halsey, W. S.	Philadelphia, 1858, 70, 72. (d. 1874.)
Hamilton, George,	Philadelphia, 1872.
Hamilton, Hugh,	Harrisburg, 1878.
Handy, J. H.	Philadelphia, 1848. (d. 1853.)

Hare, Prof. Robert, (M.I.)	Philadelphia, 1847. (d. 1858.)
Harlan, George C.	Philadelphia, 1872.
Harlow, Lewis D.	Philadelphia, 1872.
Harris, A. J.	Hillerstown, 1870.
Harris, Robert P.	Philadelphia, 1872.
Harrison, F. C.	Bloomsburg, 1860.
Hart, Alex. C.	Philadelphia, 1847.
Hartmann, Paul A.	Harrisburg, 1876.
Hartshorne, Edward,	Philadelphia, 1853, 55, 58, 68, 72.
Hartshorne, Henry,	Philadelphia, 1852, 55, 58, 70, 72, 76.
Harvey, Ellwood,	Chester, 1876.
Harvey, O. F.	Wilkes-Barre, 1880
Harvey, Samuel H.	Doe Run, 1848.
Hatfield, Nathan L.	Philadelphia, 1848, 49, 51, 54, 55, 58, 60, 64, 66, 70, 71, 72, 74, 76, 77, 78, 80.
Hay, Thomas,	Philadelphia, 1866, 72, 76, 80.
Hayes, D. D.	Shippensburg, 1876.
Hays, D. S.	Hollidaysburg, 1876.
Hays, Isaac,	Philadelphia, 1846, 47, 48, 49, 51, 52, 53, 55, 58. (d.)
Hays, I. Minis,	Philadelphia, 1872.
Hays, Robert C., (M.)	Shippensburg, 1870.
Heger, Anthony,	Pottsville, 1853, 55.
Heilman, Salem,	Sharon, 1878.
Hellsby, Thomas A.	Williamsport, 1872, 74, 78, 80.
Henderson, J. D. W.	Glen Lock, 1876.
Henry, F. P.	Philadelphia, 1880.
Herbst, Wm.	Reading, 1856.
Herman, A. J.	Carlisle, 1874, 80.
Herr, A. J.	Lancaster, 1872.
Herr, M. L.	Lancaster, 1880.
Herron, Wm. M.	Allegheny City, 1870, 72.
Hewson, Addinell,	Philadelphia, 1855, 72, 76, 80.
Heysham, Charles S.	Newtown Square, 1873.
Hiester, F. M.	Reading, 1853, 55. (d. 1864.)
Hiester, J. P., (O.)	Reading, 1852. (d.)
Hinkle, A. G. B.	Philadelphia, 1872, 76.
Hinkle, Franklin, (X)	Marietta, 1856, 58, 66, 67.
Hodge, Hugh L.	Philadelphia, 1848, 55. (d. 1873.)
Hodge, H. Lenox,	Philadelphia, 1870, 72, 75, 76.
Hollingsworth, Samuel L.	Philadelphia, 1855, 58. (d.)
Holmes, Daniel,	Philadelphia, 1863, 64, 65. (d. 1869.)
Hopkins, Ephraim,	Marshalton, 1872.
Horner, Wm. E.	Philadelphia, 1849, 52. (d. 1853.)
Horton, George F.	Terrytown, 1858, 60, 66, 70, 72, 76, 80.
Hosack, John P.	Mercer, 1876.
Houstoun, James S. (M.)	Philadelphia, 1870.
Howell, S. B.	Philadelphia, 1872.
Hughes, J. W.	Blairsville, 1874, 76, 80.
Huler, John,	1847.
Hull, W. R.	Williamsport, 1870.
Humes, Samuel	Lancaster, 1847, 48. 49. (d. 1853.)
Humphreys, G. L.	Irwin's Station, 1878.
Hunt, William,	Philadelphia, 1859, 68, 72.
Hunter, Charles H.	Reading, 1858, 64.
Hunter, Charles T.	Philadelphia, 1878, 80.
Hunter, D.	Tamaqua, 1872.
Husselton, W. S.	Allegheny, 1872, 75, 76, 77.
Huston, Robert M.	Philadelphia, 1848. 50, 51, 52. (d.)
Hutchinson, Jas. H.	Philadelphia, 1864, 65, 72, 76.

Innis, Charles,	Easton, 1853, 55. (d. 1880.)
Irwin, Crawford,	Hollidaysburg, 1878.
Irwin, John S.	Pittsburg, 1850.
Jackson, J. E.	Fallston, 1868. (d.)
Jackson, R. M. S.	Cresson, 1855. (d. 1865.)
Jackson, Samuel, of Northumberland,	Philadelphia, 1847, 48, 49, 55. (d. 1869.)
*Jackson, Samuel,	Philadelphia, 1847, 48 V.P., 49, 52, 53, 55. (d. 1872.)
James, O. P.	Doylestown, 1855, 56, 58.
James, Robert E.	Stone Church, 1855.
Jameson, E. W.	Reading, 1872.
Janney, Benj. Say,	Philadelphia, 1847, 51, 55. (d. 1859.)
Janney, W. S.	Philadelphia, 1880.
Jenks, W. F.	Philadelphia, 1872.
Jewell, Wi son,	Philadelphia, 1847. 53, 55, 58, 60 V.P., 63, 64, 66. (d. 1868.)
Jimenez, J. M., (M.)	Philadelphia, 1870.
Jones, Henry Isaac,	Scranton, 1878, 79, 80.
Jones, M. O.	Pittsburg, 1876.
Joynes, Levin S.	Philadelphia, 1847, 48.
Keating, William V.	Philadelphia, 1853. 55, 72.
Keem, John, (M.)	Lancaster Co., 1853.
Keen, W. W.	Philadelphia, 1872, 76, 80.
Keiffer, S. B.	Carlisle, 1872, 80.
Keith, William,	Philadelphia, 1849, 53, 54. (d.)
Keneagy, Samuel,	Strasburg, 1854.
Kennedy, Alfred L.	Philadelphia, 1853.
Kerfoot, George B.	Lancaster, 1847, 50. (d.)
Kerlin, Isaac N.	Media, 1865, 72, 75, 76, 77. 78.
Kerr, Jas. W.	York, 1848, 53, 55, 58, 64, 65, 66, 68, 70, 72, 76, 80.
Keyser, Peter D.	Philadelphia, 1870, 72, 76, 80.
Kibler, C. B.	Corry, 1876 78.
King, Cyrus B.	Allegheny, 1875, 76, 80.
King, C. R.	Philadelphia, 1847.
King, George A.	Lancaster, 1871.
*King, James,	Pittsburg, 1866, 71, 74, 75, 79. (d. 1880.)
Kirk, J. D.	East Fredonia, 1876.
Klapp, Wm. Henry,	Philadelphia, 1849, 51, 55. (d. 1855.)
Klingensmith, J. P.	Derry Station, 1878.
Knight, Wm. L.	Philadelphia, 1858, 64, 65, 66, 68, 70, 72. (d.)
Knipe, J. O.	Lancaster, 1880.
Knorr, W. Morrow, (M.)	Reading, 1860. (d.)
Knox, S. B. P.	Brownsville, 1872.
Knox, Wm. F.	McKeesport, 1868, 70, 72, 74, 75, 77, 80.
Koehler, John G., (M.)	1855.
Koerper, Joseph F.	Philadelphia, 1872.
Koser, S. S.	Tremont, 1880.
Kuhn, Geo. R.	Reading, 1880.
Kuhn, Louis DeB.	Reading, 1872, 73, 80.
Kurtz, S. L.	Reading, 1872.
Ladd, Horace,	Scranton, 1872, 80.
Lajus, D. Paul,	Philadelphia, 1851, 52, 55. (d.)
Lamb, John F.	Frankford, 1851, 53, 55, 58, 60. (d. 1869.)
Landis, Henry,	Marietta, 1870.
Landis, Joseph A.	Philadelphia, 1866.
Lane, Samuel G.	Chambersburg. 1872, 76, 77.
Lang, Edmund,	Philadelphia, 1851. (d.)

Langfitt, W. J.	Allegheny, 1870, 74, 77.
La Roche, C. Percy,	Philadelphia, 1858, 60, 64.
*La Roche, Rene,	Philadelphia, 1847, 49, 50, 51, 53, 54, 55, 58, 60, 64, 72. (d. 1872.)
Laughlin, J. Eneu, (M.)	Philadelphia, 1872.
Leach, Alonzo L.	Philadelphia, 1870.
Leake, E. F., (M.)	Philadelphia, 1853.
Leaman, Bernard,	Leaman Place, 1872.
Leaman, Henry,	Philadelphia, 1872.
Leasure, D.	Allegheny, 1872.
Lee, Benjamin,	Philadelphia, 1868, 70, 72, 74, 76, 80.
Leib, H. F.	Philadelphia, 1848. (d. 1856.)
Leidy, Joseph,	Philadelphia, 1854, 56, 72.
Leidy, Philip,	Philadelphia, 1871.
Le Moyne, F.	Allegheny, 1872.
Leslie, J. D.	Susquehanna, 1876.
Levick, James J.	Philadelphia, 1864, 66, 67, 72, 76.
Levis, M. M.	Philadelphia, 1858. (d.)
Levis, Richard J., (M.)	Philadelphia, 1853, 80.
Lewis, F. W.	Philadelphia, 1868, 72. (d. 1872.)
Lewis, Samuel,	Philadelphia, 1851, 55, 58, 68, 72.
Linderman, R. J.	Quakertown, 1864, 68.
Lineaweaver, John K.	Columbia, 1872, 79.
Linn, George A.	Monongahela City, 1874, 76, 77.
Lippincott, J. A.	Pittsburg, 1880.
Little, Joseph H.	West Alexandria, 1872.
Little. S.	Philadelphia, 1855, 66.
Littlefield, J. Dana,	Titusville, 1880.
Livingston, T. M.	Montville, 1876.
Livingstone, J. B	West Middlesex, 1874.
Longstreth, M. Fisher,	Darby, 1876, 80.
Loop, Dennis D.	North-East, 1873, 78.
Lovett, A. S.	Erie, 1876.
Lowman, John,	Johnstown, 1853, 55, 75, 78.
Luden, J. B.	Huntingdon, 1856, 64. (d.)
Ludlow, J. L.	Philadelphia, 1855, 72.
Lyon, Thomas,	Williamsport, 1872, 74.
McCann, James,	Pittsburg, 1870, 73, 74, 75, 76, 80.
McClellan, John H. B.	Philadelphia, 1849, 51, 52, 55, 58, 72. (d. 1874.)
McClintock, James, (X.)	Philadelphia, 1847.
McClure, W. J.	New Oxford, 1876.
McClurg, John R.	West Chester, 1858, 72, 76, 80.
McConaughy, D. W.	Latrobe, 1872.
McConaughy, James,	Mount Pleasant, 1866, 70, 72, 76, 77.
McConaughy, R.	Mount Pleasant, 1880.
McCook, George, (M.)	Pittsburg, 1866.
McCorkle, Wm. S.	Columbia, 1852.
McCoy, G. R.	Doylestown, 1864.
McCoy, John,	Bellefontaine, 1847.
McCulloch, John,	Huntingdon, 1856.
McDonald, Nesbit,	Pittsburg, 1868, 72, 76, 80.
McGowan, Hiram,	Harrisburg, 1875.
McIlvain, W.	York, 1848.
McKennon, Thomas,	Washington, 1869.
McMichael, J.	Barnharts Mills, 1876.
McRean, Thomas A.	Philadelphia, 1870, 72.
McVicker, Jos. P.	Williamsport, 1878.
Mabon, Thomas,	Allegheny, 1873, 80.
Madison, R. L.	Philadelphia, 1858. (d.)
Magill, W. H.	Danville, 1872.

Mahan, J. T, (M.I.)	Mifflin, 1870.
Mahon, O. S.	Columbia, 1854.
Mann, Chas., (M.)	Montgomery Co., 1876.
Marquis, D. S.	Rochester, 1876.
Marshall, Nathan S.	West Vincent, 1866.
Martin, Charles H.	Allentown, 1855.
Martin, John A.	Whitemarsh, 1855.
Mason, E. Hastings,	Towanda, 1863, 66.
Mason, J. K., (M.)	Philadelphia, 1853.
Massey, Isaac,	West Chester, 1866.
Matson, Charles M.	Brookville, 1878, 80.
Matthews, Charles H.	Doylestown, 1849. (d.)
Matthews, Jos. M., (M.)	Temple, Berks Co., 1868.
Maury, F. F.	Philadelphia, 1872. (d. 1879.)
Mausteller, J. D.	Danville, 1880.
Mayburry, Wm.	Philadelphia, 1847, 49, 52, 53, 55, 58, 63, 64, 65, 66, 68, 72. (d. 1873.)
Mayer, J. H.	Willowstreet, 1873.
Mays, Thomas J.	Upper Lehigh, 1876.
Meade, Samuel H.	Philadelphia, 1854.
Mears, J. Ewing,	Philadelphia, 1870, 72, 80.
Mehard, S. S.	Mercer, 1872.
*Meigs, Charles D.	Philadelphia, 1847, 51, 53, 55. (d. 1869.)
*Meigs, J. Aitken,	Philadelphia, 1858, 70, 72. (d. 1879.)
Merklein, Chas. H.	Chambersburg, 1880.
Miller, A. M.	Bird-in-Hand, 1880.
Miller, D. P.	Huntingdon, 1872, 74, 76.
Miller, Oliver Laird,	Allegheny, 1877, 80.
Millick, John W.	Philadelphia, 1872.
Mills, Charles K.	Philadelphia, 1872, 80.
Mills, Edward,	Ulster, 1872.
*Mitchell, John K.	Philadelphia, 1847, 49, 50, 52, 53. (d. 1858.)
Mitchell, S. B. W.	Philadelphia, 1872. (d. 1879.)
Mitchell, S. Weir,	Philadelphia, 1880.
Mixsell, Joseph,	Easton, 1880.
Montgomery, John,	Chambersburg, 1872, 80.
Moody, George O.	Titusville, 1878.
Moody, H. M.	E. Smithfield, 1872.
Moore, J. Wilson,	Philadelphia, 1847. (d. 1865.)
Morris, B. Wister, Rev., (M.I.)	Philadelphia, 1867.
Morris, Casper,	Philadelphia, 1846, 47, 50, 55.
Morris, J. Cheston,	Philadelphia, 1858, 66.
Morris, Sidney R.	Philadelphia, 1868, 72.
Morrison, M. P.	Monongahela, 1875, 76, 78, 80.
Morton, C. J.	Springfield, 1855.
Morton, Samuel George,	Philadelphia, 1847. (d. 1851)
Morton, Thomas Geo.	Philadelphia, 1864, 72, 80.
Mosser, David O.	Breinigsville, 1855.
Mosser, Martin B.	Mechanicsburg, 1873, 78.
Mossman, Beriah E.	Greenville, 1874.
Mowry, Robert B.	Allegheny City, 1850, 67, 71, 72, 76 78.
Muhlenberg, F. A.	Lancaster, 1848.
Muhlenberg, Henry E.	Lancaster, 1849.
Murphy, Andrew,	Parkersburg, 1849.
Murphy, J. A.	Wilkes-Barre, 1878.
Mütter, Thomas Dent,	Philadelphia, 1847, 49. (d. 1859)
Murdock, James B.	Pittsburg, 1875, 76.
Musser, J. Henry,	Lampeter, 1880.

Nagle, Hiester M.	Reading, 1868.
Nancrede, Chas. B.	Philadelphia, 1880.
Naudain, Arnold,	Philadelphia, 1847, 55. (d.)
Nebinger, Andrew,	Philadelphia, 1858, 60, 64, 65, 66, 68, 72, 76.
Neill, John,	Philadelphia, 1847, 48, 49, 51, 55, 56, 58. (d. 1879.)
Newbaker, P. C.	Washingtonville, 1876.
Newberg, Milton,	Whitemarsh, 1858.
Newcomet, H. W.	Philadelphia, 1880.
Newton, D. N.	Towanda, 1872, 78.
Norris, Geo. W.	Philadelphia, 1846, 47, 48, 49, 50 V.P., 51, 52, 54, 55. (d.)
Norris, Herbert,	Philadelphia, 1872.
Nutt, George D.	Williamsport, 1872.
Nye, W. H., (M.I.)	1864.
Ogier, Stephen A.	Frazier, 1853, 55. (d. 1861.)
O'Hara, Michael,	Philadelphia, 1878, 80.
O'Neal, J. W. C.	Gettysburg, 1875, 76.
Orlady, H.	Petersburg, 1856.
Orth, H. L.	Harrisburg, 1877.
Osler, Owen,	Philadelphia, 1858, 64, 70.
Ozias, H. W.	Philadelphia, 1872.
Packard, John H.	Philadelphia, 1860, 68, 70, 72, 78, 80.
Page, William Byrd,	Philadelphia, 1848, 51, 55, 72. (d.)
Palmer, Henry,	Philadelphia, 1863.
Pancoast, Joseph,	Philadelphia, 1848, 53, 55.
Pancoast, William H.	Philadelphia, 1868, 72, 76, 80.
Parke, A. G. B.	Gap, 1880.
Parker, Samuel,	Lancaster, 1854, 58, 60, 66. (d. 1870.)
Parrish, C. W., (M.)	Chester Co., 1853.
Parrish, Isaac,	Philadelphia, 1846, 47, 48, 49, 50. (d. 1852.)
Parrish, W. H.	Philadelphia, 1872.
Parry, Ely,	Lancaster, 1851.
Parry, John S.	Philadelphia, 1872. (d.)
Patterson, G. W.	Philadelphia, 1848. (d. 1852.)
Patterson, Henry S.	Philadelphia, 1846, 47. (d. 1854.)
Paul, J. Rodman,	Philadelphia, 1846, 47, 48, 51, 55. (d.)
Peebles, H. P.	New Castle, 1876.
Peebles, J. H. M.	New Castle, 1872.
Pennepacker, H.	Hartford, 1876.
Penneypacker, Isaac A.	Philadelphia, 1855. (d.)
*Pepper, William,	Philadelphia, 1847, 55. (d. 1864.)
Pepper, William,	Philadelphia, 1872, 76, 80.
Perchment, John,	Pittsburg, 1867.
Perdue, W. R.	Unionville, 1880.
Perkins, C. F.	Erie, 1867. (d. 1872.)
Phillips, Ellis,	Connellsville, 1876.
Phister, Benjamin, Jr.,	Philadelphia, 1864.
Pickett, M.	Corny, 1880.
Piper, William A.	Philadelphia, 1853, 55.
Pollock, Alex. McCandless,	Pittsburg, 1850, 55, 68, 69, 70, 71, 72, 73, V.P., 74, 75, 76, 77, 78, 79.
Pollock, Samuel,	Williamsport, 1866, 70.
Porter, W. G.	Philadelphia, 1872.
Price, Jacob,	West Chester, 1864, 65, 72.
Priestley, Joseph,	Northumberland, 1872.
Pursell, Isaac,	Danville, 1876, 80.
Rahauser, George G.	Pittsburg, 1878, 80.
Ramsey, Robert W.	St. Thomas, 1880.

Rand, B. Howard,	Philadelphia, 1868, 72.
*Randolph, Jacob,	Philadelphia, 1847. (d. 1848.)
Rankin, D. N.	Allegheny, 1878, 80.
Raub, J. K.	Quarryville, 1855, 56, 58.
Ray, Isaac,	Philadelphia, 1872.
*Ray, John T.	Meadville, 1868, 70, 73. (d. 1874.)
Reagan, G. L.	Shenandoah, 1876.
Ream, John,	Hempfield, 1854, 55, 56, 58. (d. 1869.)
Reber, Chas. T.	Reading, 1866.
Reed, Alfred G.	Philadelphia, 1872.
Reed, J. A., (M.I.)	Pittsburg, 1877, 80.
Reed, Thomas B.	Philadelphia, 1872.
Reese, John G.	Philadelphia, 1852, 53, 55.
Reiter, W. C.	Pittsburg, 1870.
*Remington, Isaac,	Philadelphia, 1847. (d. 1862.)
Renninger, Abiam C.	Harrisburg, 1875.
Revinus, Edward F.	West Chester, 1849, 51.
Rich, Thomas C.	Philadelphia, 1878.
Richards, C. Orrick,	Lancaster, 1853. (d. 1862.)
Richards, J. N.	Riddlesburg, 1876.
*Richardson, Braton,	Montrose, 1863. (d. 1864.)
Richardson, David D.	Philadelphia, 1864, 66, 67.
Richardson, E.	Philadelphia, 1872.
Richardson, Joseph G.	Philadelphia, 1870, 72, 76.
Richardson, T. Gibson,	Philadelphia, 1858.
Richardson, W. L.	Nesquehoning, 1863, 70, 72, 76, 77.
Richie, R. W.	Philadelphia, 1864.
Rickards, Wm. M. L.	Philadelphia, 1874, 77, 78.
Rieser, Frank,	Reading, 1856, 58, 59, 64, 70.
Riggs, Elliot S.	Allegheny, 1876, 80.
Righter, Washington,	Columbia, 1872.
Risley, Samuel D.	Philadelphia, 1880.
Ritchey, John A.	Oil City, 1876, 78, 80.
Roberts, John B.	Philadelphia, 1880.
*Robinson, Matthew F.	Newville, 1871. (d. 1874.)
Rodman, Lewis,	Philadelphia, 1847, 48, 49, 55.
Rogers, Jas. B.	Philadelphia, 1847. (d.)
Rogers, Robert E.	Philadelphia, 1853, 55, 64, 72, 76.
Rohrer, Benjamin,	Columbia, 1851, 53, 58.
Roller, W. C.	Hollidaysburg, 1876, 80.
Roop, J. W.	New Cumberland, 1878.
Ross, James,	Clarion, 1870, 71, 79.
Ross, James F.	Clarion, 1876.
Ross, John D.	Williamsburg, 1854, 55, 76.
Ross, S. M.	Greenville, 1872.
Rothrock, Abram,	McVeytown, 1855.
Rowland, Francis F.	Media, 1877.
Ruschenberger, W. S. W.	Philadelphia, 1850, 53, 60, 72, 76.
Rutherford, Wm. W.	Harrisburg, 1868. (d. 1873.)
Rutledge, S. R.	Blairsville, 1876, 80.
Sandt, John,	Stockton, 1872.
Sargent, Winthrop J.	Philadelphia, 1849, 55, 64, 65.
Saunders, J. H., (M.I.)	Bradford Co., 1864.
Savery, Wm.	Philadelphia, 1865.
*Schneck, B. F.	Lebanon, 1857, 58, 60, 65. (d. 1865.)
Scholfield, Edwin,	Philadelphia, 1864, 66. (d. 1871.)
Schrack, John,	Shannonville, 1859.
Schultz, S. S.	Danville, 1868.
Seiler, Carl,	Philadelphia, 1880.
Seiler, Jeremiah,	Harrisburg, 1870.
Seiler, John P.	Harrisburg, 1876.

Seiler, R. H.	Harrisburg, 1872. (d. 1876.)
Semple, John,	Wilkinsburg, 1880.
Seip, Amos,	Easton, 1864, 76, 80.
Seiss, R. S.	Littlestown, 1876.
Shakespeare, E. O.	Philadelphia, 1880.
Shannon, B. F.	Schuylkill Haven, 1872.
Shaw, Thomas W.	Pittsburg, 1868, 73.
Shearer, J. M.	Dillsbury, 1880.
Shearer, Jas. Y.	Sinking Spring, 1880.
Sheller, Adam,	Mount Joy, 1856, 66
Shelmerdine, R. Q.	Philadelphia, 1858. (d.)
Shilleto, G. M.	Allegheny, 1879, 80.
Shoemaker, Benj.	Brownsville, 1876.
Shoemaker, Charles,	Jenkintown, 1855.
Shoemaker, John V.	Philadelphia, 1878, 79, 80.
Sholl, E. R.	Reading, 1860.
Short, R. N.	Mechanicsburg, 1880.
Shunk, F. R., (M.)	Philadelphia, 1853.
Singer, J. E.	Newport, 1872.
Sinkler, Wharton,	Philadelphia, 1872.
Slocum, A. M.	Philadelphia, 1858.
Smaltz, J. Henry,	Philadelphia, 1855, 58, 64, 66, 72.
Smith, Albert H.	Philadelphia, 1878, 79.
Smith, B. B.	Allegheny, 1876.
Smith, E. N.	Susquehanna Depot, 1875, 76, 80.
*Smith, Francis G.	Philadelphia, 1849, 50, 53, 55, 58, 65, 69, 70 V.P., 71. (d. 1878.)
Smith, G. W.	Hollidaysburg, 1872, 76, 80.
Smith, Henry H.	Philadelphia, 1855, 58, 72, 76, 77, 78, 80.
Smith, Henry Yale,	Philadelphia, 1855, 64.
Smith, Latham A.	New Milford, 1860, 64, 65, 76.
Smith, Moses B.	Philadelphia, 1847. (d. 1865)
Smith, Robert K.	Philadelphia, 1852, 53, 55, 56, 59.
Smyth, Francis G., Jr.,	Philadelphia, 1872. (d. 1879.)
Snavely, C. J.	Manheim, 1866.
Snively, Isaac N.	Waynesborough, 1876.
Snodgrass, James H.	Pittsburg, 1872, 74, 77.
Snowden, S. Gustine,	Franklin, 1870.
Spaulding, S. C.	Shenandoah, 1880.
Spencer, T. D.	Philadelphia, 1853, 55. (d. 1857.)
Spooner, Edward A.	Philadelphia, 1860.
Stahley, Geo. B.	Harrisburg, 1880.
Stanton, David,	New Brighton, 1856, 67. (d. 1871.)
Stebbins, Sumner,	Unionville, 1876.
Stein, Edward M., (M.I.)	1864.
Steinmetz, E. G.	Hokendauqua, 1878.
Stetler, John G.	Philadelphia, 1870, 72.
Stevenson, J. M.	Greenville, 1872.
Steward, Jos. D.	Philadelphia, 1847. (d. 1854.)
Stewardson, Thomas,	Philadelphia, 1860. (d.)
Stewart, Alex.	Shippensburg, 1868.
Stewart, J. L.	Erie, 1876.
Stewart, Scott,	Philadelphia, 1860, 72.
Stewart, Wm. S.	Philadelphia, 1876. 80.
Stiles, George,	Conshohocken, 1876, 78, 80.
Stiles, R. Cresson,	Westchester, 1860.
Stillé, Alfred,	Philadelphia, 1846, 47, 48, 49, 50, 52, 53, 55, 67, 70, 71 P., 72.
Stillé, Moreton,	Philadelphia, 1853, 55. (d. 1855.)
Stocker, Anthony E.	Philadelphia, 1852, 55, 56, 58.

Strawbridge, George,	Philadelphia, 1872, 76.
Strawbridge, James D.	Danville, 1860, 70, 72.
Strickland, D. H.	Fairview, 1870.
Stroud, Wm. D.	Philadelphia.
Stubbs, Jeremiah B.	Rock, 1849, 52, 53, 55.
Stubbs, J. H.	London Grove, 1880.
Sutton, R. S.	Pittsburg, 1871, 76.
Swan, Samuel,	Johnstown, 1872.
Swartz, Joseph,	Duncannon, 1866, 67, 68, 70, 72, 74, 76.
Swayne, Caleb,	London Grove, 1859. (d. 1860.)
Swift, Edward,	Easton, 1855.
Taylor, William Terry,	Philadelphia, 1869, 70, 72, 74, 76, 80.
Thayer, A.	Erie, 1878.
Thickstun, G.	Wattsburg, 1880.
Thomas, Charles H., (M.I.) (M.)	Philadelphia, 1870, 71, 80.
Thomas, G. W.	Norristown, 1847. (d. 1848.)
Thomas, Isaac,	Westchester, 1849, 51, 53, 54, 55.
Thomas, J. D.	Pittsburg, 1874, 73, 80.
Thomas, John R.	Wayne Co., 1863.
*Thomas, Robert P.	Philadelphia, 1855. (d. 1864.)
Thompson, Benjamin,	Westchester, 1864,
Thompson, L. M.	Mahanoy City, 1876.
Thompson, Sidney,	Spruce Creek, 1864, 74.
Thompson, Wm. S.	Lancaster, 1849, 55.
Thomson, J. A.	Wrightsville, 1876.
Todd, James John,	Pittsburg, 1875.
Todd, John E.	Philadelphia, 1864.
Townsend, R. H.	Philadelphia, 1848, 49, 51, 53, 55, 58, 66, 71, 72.
Townsend, Ralph M.	Philadelphia, 1872. (d.)
Townsend, W. W.	Chatham, 1855, 59, 70.
Treadway, Fred.	Williamsport, 1865.
Treichler, C. Galen,	Honeybrook, 1880.
*Treichler, Jacob F.	McKeansburg, 1872. (d. 1879.)
Treichler, S. K.	Jonestown, 1858, 72.
Troth, Samuel N.	Philadelphia, 1863, 64, 72, 76, 77.
Tucker, David H.	Philadelphia, 1847. (d.)
Tuft, John B., (M.)	Philadelphia, 1852.
Turnbull, Laurence,	Philadelphia, 1852, 55, 72, 76, 80.
Tyson, James,	Philadelphia, 1872, 76, 80.
Uhler, John,	Philadelphia, 1847. (d. 1856.)
Ulrich, D. A.	Reading, 1872.
Ulrich, William B.	Chester, 1875, 76, 77, 80.
Unger, David F.	Mercersburg, 1880.
Van Buskirk, Wm. A.	Pottstown, 1853.
Vankirk, T. R.	McKeesport, 1874.
Van Valzah, S. L.	Mifflinsburg, 1876.
Van Voorhis, J. S.	Belle Vernon, 1872.
Varian, William,	Titusville, 1872, 76, 80.
Vastine, J. H.	Numidia, 1876, 80.
Wadsworth, Henry,	Philadelphia, 1852.
Walker, Isaac R.	Spread Eagle, 1848, 51, 52, 53, 55. (d.)
Wallace, Edward,	Reading, 1855, 58, 63, 64, 65, 66, 72. (d.)
Wallace, Ellerslie,	Philadelphia, 1858.
Wallace, W. M.	Erie, 1870. (d.)
Walsh, Samuel,	Philadelphia, 1852.
Warrington, Joseph,	Philadelphia, 1846.
Watson, W. H., (M.I.)	Bedford, 1855.
Watters, D. C.	Tioga, 1878.
Weaver, J. K.	Norristown, 1878, 80.

Weaver, W. G.	Wilkes-Barre, 1880.
Webb, W. W.	Wellsborough, 1872.
Weidler, Isaac C.	Leacock, 1854, 56.
Weidman, W. Murray,	Reading, 1868.
Welch, William,	Philadelphia, 1872, 76, 80.
Wells, Wm. Lehman,	Philadelphia, 1866, 76.
Welsh, Wm. S.	Franklin, 1872, 77.
*West, Francis,	Philadelphia, 1846, 47, 48, 49, 51, 52, 53, 54, 55. (d. 1868.)
Whenn, W. Laurie,	Franklin, 1873.
Wilcox, Alexander,	Philadelphia, 1851.
Wiley, Penrose,	Leesport, 1858, 70. (d. 1874.)
Willard, De Forest,	Philadelphia, 1880.
Williams, John T.	Philadelphia, 1872.
Wilson, Chas., (M.)	New Berlin, 1876. (d. 1877.)
Wilson, Ellwood,	Philadelphia, 1855.
Wilson, James C.	Philadelphia, 1872.
Wilson, Wm. J.	Potters Mills, 1847.
Wiltbank, John,	Philadelphia, 1847, 48. (d. 1860.)
Wimley, G. W.	Limerick, 1853, 55.
Winans, Isaac,	New Brighton, 1873.
Wister, Caspar,	Philadelphia, 1852, 53, 55, 56, 57, 58, 59, 60, 64, 66, 72.
Witman, Henry O.	Harrisburg, 1876.
Witmer, A. H.	Philadelphia, 1872.
Wittig, Charles F.	Philadelphia, 1866.
Wood, E. A.	Pittsburg, 1870, 72, 73, 75, 76, 80.
*Wood, George B.	Philadelphia, 1847, 49, 51, 52, 55 P., 56, 58. (d. 1879.)
Wood, H. C.	Philadelphia, 1872, 75, 76, 77.
Wood, Thomas	Muncy, 1849.
Woodbury, Frank,	Philadelphia, 1877, 78, 79, 80.
Woods, J. F.	Boalsburg, 1878, 80.
Worthington, Joshua H.	Philadelphia, 1872.
Worthington, Wilmer,	West Chester, 1848, 55, 58. (d. 1874.)
Yardley, Thomas H.	Philadelphia, 1847, 49, 50, 51, 53, 55, 58. (d. 1860.)
Yeager, Theo. C.	Allentown, 1865. (d. 1874.)
Young, Theodore J.	Titusville, 1874.
Ziegler, George J.	Philadelphia, 1853, 55, 76.
Ziegler, Jacob L.	Mount Joy, 1852, 53, 77, 80.
Zitzer, John Jacob,	Carlisle, 1869, 71, 72.
Zulick, S. M.	Orwigsburg, 1848.

RHODE ISLAND.

Allen, Edward Styles,	Providence, 1880.
*Allen, Hiram,	Woonsocket, 1852, 53. (d. 1864.)
Anthony, Walter E.	Providence, 1876.
Arnold, S. Augustine,	Providence. (d.)
Ballon, Ariel.	Woonsocket, 1855, 64, 65, 80.
Ballow, Asa W.	Smithfield, 1849. (d.)
Batchelder, D. Homre,	Cranston, 1860, 65.
Baker, George P.	Providence, 1855, 60, 67, 68, 80.
Becker, Alex. R.	Providence, 1865.
Brown, W. Owens,	Providence, 1855, 58, 64.
Brownell, Richmond,	Providence, 1853. (d.)
Browning, A. G.	Providence, 1880.
Browning, A. T.	Olneyville, 1867.

Bullock, Otis,	Warren, 1864, 65, 66, 67, 68, 70, 72, 74, 80.
Bullock, William T.	Providence, 1869. (d.)
Burge, W. J.	Pawtucket, 1880.
Butler, Samuel W.	Newport, 1865, 76.
Capron, George,	Providence, 1849, 53, 65, 74, 76.
Carr, George W.	Providence, 1880.
Caswell, Edward T.	Providence, 1877, 80.
*Clapp, Sylvianus,	Pawtucket, 1849, 51, 53, 60, 64, 65. (d. 1879.)
Cleveland, Hiram,	North Providence, 1853. (d.)
Clifford, Lewis W.	Providence, 1849. (d.)
*Collins, George Lewis,	Providence, 1849, 58, 69, 71. (d. 1877.)
Drury, Samuel S.	Bristol, 1868. (d. 1879.)
Dunn, Theophilus C.	Newport, 1846, 47, 49, 53, 65, 66 V.P. (d.)
Edwards, Daniel M.	Woonsocket, 1872.
Eldridge, James H.	Greenwich, 1855, 59, 60, 65.
Ellis, J. James,	Bristol, 1860. (d.)
Ely, James W. C.	Providence, 1849, 60, 65, 80.
Fifield, Moses,	Centreville, 1880.
Fisher, Charles H.	Providence, 1858, 76, 79, 80.
*Fowler, Ezekiel,	Woonsocket, 1848, 49, 50, 51, 52, 53, 58, 60. (d. 1863.)
Gardner, C. T.	Providence, 1880.
Gardner, Johnson,	Providence, 1864, 65, 68. (d.)
Garvin, L. F. C.	Louisdale, 1871.
Harris, Edward M.	Providence, 1868, 73, 80.
Jenckes, Geo. W.	Woonsocket, 1865, 76.
Kenyon, Job,	Providence, 1860, 64, 72, 74, 79, 80.
King, David,	Newport, 1848, 49, 53, 55, 56, 70, 76.
King, Howard W.	Providence, 1867, 68. (d. 1876.)
Lawton, Thomas C.	Cranston, 1878.
Leonard, Charles H.	Providence, 1880.
Le Prohon, E. P.	Providence, 1851. (d.)
Mason, Geo. E.	Providence, 1867.
Mauran, Joseph,	Providence, 1848, 49, 51, 52, 53, 55, 58, 60, 64, 65. (d.)
Miller, Horace G.	Providence, 1868.
Miller, Lewis L.	Providence, 1849, 53, 64. (d.)
Morton, Lloyd,	Pawtucket, 1865, 73.
Myers, S. Oscar,	Wickford, 1880.
Newell, Timothy,	Providence, 1860, 65, 80.
Newell, Thomas K.	Providence, 1860, 67.
Noyes, Robert F.	Providence, 1880.
O'Leary, Charles,	Providence, 1880.
Palmer, Wm. H.	Providence, 1877.
Parsons, Charles W.	Providence, 1849, 53, 55, 65.
*Parsons, Usher,	Providence, 1847, 48, 49, 50, 51, 52, 53 V.P., 54, 55, 58, 60, 64, 65. (d. 1868.)
Peckham, Fenner H.	Providence, 1858, 60, 64, 65, 72.
Pierce, George A.	Providence, 1858.
Porter, G. W.	Providence, 1880.
Pratt, Henry P.	Providence, 1850, 51. (d.)
Ray, Isaac, (M.I.)	Providence, 1867.
Rivers, Henry W.	Providence, 1852, 53. (d. 1868.)
Robbins, A. O.	Providence, 1880.
Snow, Edwin M.	Providence, 1853, 58, 73.
Storer, Horatio R.	Newport, 1878.
Traver, W. H.	Providence, 1865, 80.

Tyng, Anita E. Providence, 1877, 80.
Vinton, Fred. A. Providence, 1878.
Warren, J. E. Cumberland, 1856. (d.)
West, Samuel, (M.I.) Tiverton, 1849.
Wiggin, O. C. Providence, 1876.

SOUTH CAROLINA.

Aiken, Edward Wm. Winnsboro, 1879.
Bailey, S. W. Charleston, 1852, 53, 54, 55, 56, 57, 58. (d.)
Barker, Robert S. Charleston, 1848, 51, 52.
Barnch, S. Camden, 1880.
Barratt, J. P. Abbeville, 1851, 58. (d.)
Bellinger, John, Charleston, 1851. (d.)
Bradley, B. W. Kingstree, 1853, 56.
Brisbane, W. H. Beaufort, 1870. (d. 1880.)
Brown, Pike, Barwell, 1860.
Cain, Daniel J. Charleston, 1851, 53.
Chazal, J. P. Charleston, 1879.
Clawson, C. L. Nation Ford, 1851.
Coffin, Amory, Aiken, 1851, 55.
Crane, Joseph S. Columbia, 1851, 53.
Croft, F. G. Aiken, 1879.
Darby, John T. Columbia, 1870. (d.)
Dawson, John L. Charleston, 1851, 54, 55.
De Saussure, H. W. Charleston, 1850, 51, 52, 76.
Dickson, S. H. Charleston, 1851. (d. 1872.)
Elfe, Edward, Charleston, 1848. (d.)
Elliot, T. A. Charleston, 1851.
Evins, T. A. Anderson, 1872. (d.)
Fair, Samuel, Columbia, 1855. (d.)
Flagg, E. Beling, Charleston, 1851, 52. (d.)
Ford, Wm. H. Charleston, 1854.
Frost, Henry R. Charleston, 1849, 50, 51, 52, 53 V.P., 54, 55, 56, 59, 60. (d. 1866.)
*Gaillard, Peter C. Charleston, 1848, 49, 51, 53, 55, 58. (d. 1859.)
Gaston, J. Mc, Columbia, 1858.
Geddings, J. F. M. Charleston, 1855.
Geddings, W. H. Aiken, 1877, 80.
Gibbes, N. H. St. Helena, 1855.
Gibbes, Robert W. Columbia, 1857, 58, 59, 72. (d. 1867.)
Giddings, Eli, Charleston, 1851, 56 V.P. (d. 1878.)
Goodwin, T. J. Orangeburg, 1851. (d.)
Happoldt, C. Charleston, 1855. (d.)
Hazell, Andrew, All Saints, 1851. (d.)
Henderson, E. R. Blue House, 1857, 58.
*Holbrook, J. E. Charleston, 1851. (d. 1871.)
Hook, J. H. St. Matthews, 1851. (d. 1861.)
Horlbeck, Elias, Charleston, 1851.
*Horlbeck, Wm. C. Charleston, 1855. (d. 1871.)
Huger, W. H. Charleston, 1859.
Jervey, James P. Charleston, 1847, 51. (d.)
Kinlock, R. A. Charleston, 1853, 55, 72, 80.
Ladd, C. H. Winnsboro, 1879.
Lebby, Robert, Charleston, 1849. 51, 52, 53, 72.
Lynch, John, Columbia, 1851, 79.
McIntosh, James, Newburg, 1876.
McKain, Wiley J. Camden, 1851, 52. (d. 1861.)

Marshall, J. W. W.	Abbeville, 1858.
May, John,	St. George's, 1853, 58.
Mayes, J. A.	Maysville, 1851.
Michel, Middleton,	Charleston, 1853.
Michel, R. F.	Charleston, 1855.
Miles, Francis T.	Charleston, 1859.
Miller, W. C.	Georgetown, 1851.
Mitchell, Ed.	Edisto, 1851. (d.)
Mitchell, J. S.	Charleston, 1856.
Mittag, J. G. F., (M.I.)	Lancaster, 1858.
Mobley, W. W.	Lancasterville, 1855. (d.)
Moore, M. S.	Statesburg, 1857.
*Moultrie, James,	Charleston, 1847 V.P., 49, 51 P., 52, 53. (d. 1869.)
Moultrie, W. L.	St. John's, 1851. (d.)
Muller, Gerhard,	Lexington, 1851.
Ogier, T. L.	Charleston, 1851.
Percival, W. F., (M.I.)	Aiken, 1868. (d.)
Porcher, F. Peyer,	Charleston, 1851, 52, 78, 80 V.P.
Porcher, F. Y.	Charleston, 1851. (d. 1862.)
Priolean, J. Ford,	Charleston, 1854, 79.
Priolean, Thomas G.	Charleston, 1849, 51, 52, 53, 54, 55. (d.)
Ravenel, St. Julian,	Charleston, 1851.
Ravenel, Wm. C.	Charleston, 1854.
Ready, J. C.	Edgefield, 1851.
Robertson, F. M.	Charleston, 1851, 55.
Robertson, T. T.	Winnsboro, 1851, 55, 58.
Rockwell, P. G.	Aiken, 1880.
Shepherd, Charles U.	Charleston, 1860.
Simons, Manning,	Charleston, 1870, 72, 76.
Simons, Thomas Y.	Charleston, 1851, 52 V.P. (d.)
*Smith, Thomas,	Society Hills, 1851, 52. (d.)
Talley, A. N.	Columbia, 1858, 70, 72, 74, 79.
Thompson, John M.	Silver Street, 1879.
Turnipseed, E. B.	Columbia, 1879.
Waring, Morton,	Black Oak, 1851.
White, Octavius,	Charleston, 1855.
Wilhite, P. A.	Anderson, 1879.
Williams, Alex.	Chesterfield, 1851.
Williman, A. B.	Charleston, 1851, 52.
Winthrop, H.	Charleston, 1851.
Wragg, Wm. T.	Charleston, 1847, 51, 53, 54 V.P., 56, 58.
Wylie, A. P.	Chester, 1870, 72.
Wylie, R. E.	Charleston, 1851.

TENNESSEE.

Abernathy, J. J., (M.I.)	Hockerville, 1857.
Atchison, Thomas A.	Nashville, 1857, 66, 67, 75, 76, 77.
Atlee, John L.	Athens, 1879.
*Avent, B. W.	Memphis, 1848, 57, 59. (d. 1878.)
Bashette, Wm. T.	Murfreesboro, 1857.
Bethsharas, H. H.	Nashville, 1857. (d.)
Blitz, A.	Nashville, 1875, 79.
Bowling, William K.	Nashville, 1854, 56 V.P., 57, 58, 59, 63, 65, 66 V.P., 69, 70, 73, 74, 75 P., 76.
Boyd, John M.	Knoxville, 1857, 79.
Brannock, J. M., (M.I.)	McLemonsville, 1857, 59.

Briggs, Wm. Thompson,	Nashville. 1869, 70, 72, 73 V.P., 74, 75, 76, 77, 78, 79, 80.
Buchanan, A. H.	Nashville, 1847 V.P., 57. (d.)
Buchanan, T. B.	Nashville, 1872.
Buist, J. R.	Nashville, 1866.
Burford, J. S.	Whiteville, 1857.
Byron, James F.	Murfreesboro, 1875.
Callender, John H.	Nashville, 1857, 59, 76, 77.
Cavanaugh, W. C.	Memphis, 1859.
Cheatham, J. L.	Nashville, 1858. (d.)
Cheatham, Richard,	Nashville, 1880.
Cheatham, Wm. A.	Nashville, 1846, 57.
Childress, W. H.	Nashville, 1857.
Clark, B. P., (M.)	1868.
Clayton, H. H.	Murfreesboro, 1857.
Clements, H. M.	Clementsville, 1854.
Clements, W. M., (M.I.)	Gainsboro, 1857.
Cliff, D. B.	Franklin, 1857.
Compton, Henry Maclin,	Nashville, 1869. (d.)
Conwell, Ira,	Nashville, 1856, 57. (d.)
Curry, R. O.	Knoxville, 1857. (d.)
Dabney, E. R.	Clarksville, 1854.
Dashiel, W. Bond, (M.I.)	Shelbyville, 1857.
Davis, Marx T.	Knoxville, 1880.
Deaderick, Chalmers,	Knoxville, 1879.
Draughon, J. A.	Nashville, 1879, 80.
Epperson, J. P.	Pulaski, 1857. (d.)
Estill, Wallace,	Winchester, 1857. (d.)
Evans, R. F.	Shelbyville, 1857.
Eve, Duncan,	Nashville, 1879, 80.
*Eve, Paul F.	Nashville, 1852, 54, 57 P., 58, 59, 67, 68, 69, 75. (d. 1877.)
Ewing, Andrew B.	Franklin, 1857.
Finley, Wm. M.	Clarksville, 1872.
Ford, John P.	Nashville, 1857. (d.)
Foster, Robert C.	Nashville, 1850, 55, 57, 58, 59, 60. (d.)
Gardner, B. F., (M.)	Chattanooga, 1873.
Glenn, W. F.	Nashville, 1880.
Grant, George R., (M.I.)	Memphis, 1854, 57, 60.
Grant, Jas. F.	Pulaski, 1875.
Guthrie, C. B.	Memphis, 1854.
Haggard, Wm. D.	Gallatin, 1854, 57, 59.
Harris, S. H.	Nashville, 1848.
Harris, Zeno,	Memphis, 1853.
Harrison, Joseph J.	London, 1879.
Haskins, E. B.	Clarksville, 1850, 59. (d. 1868.)
Hatcher, A. A.	Nashville, 1866. (d.)
Henderson, Eugene,	Murfreesboro, 1858. (d. 1867.)
Hope, W. T.	Chattanooga, 1879, 80.
Hoyte, Jas. W.	Nashville, 1857.
Hughes, Francis Marion,	Nashville, 1869.
Jamison, J. M.	Nashville, 1872.
Jamison, S. M., (M.)	1870.
Jennings, Thomas R.	Nashville, 1857. (d.)
Jilson, B. C., (M.I.)	Lebanon, 1857.
Johnson, J. L. C.	Clarksville, 1854, 57.
Jones, Alfred,	Shelbyville, 1858.
Jones, W. P.	Nashville, 1857, 66, 79.
Keller, James M.	Memphis, 1859, 68.
Kelley, John D.	Nashville, 1857. (d.)
Kennedy, Thomas J.	Cornersville, 1857. (d.)

Knight, L. W.	Murfreesboro. 1848.
Lawrence, John M.,	Nashville, 1857.
Lenoir, B. B.	Lenoir, 1849, 51, 57, 68, 73, 75, 76, 79.
Lewis, Clarence Linen,	Nashville, 1869.
Lindsley, J. Berrien,	Nashville, 1851, 53, 54, 55, 56, 57, 58, 59, 69.
Lindsley, Van S.	Nashville, 1880.
Lipscomb, Thomas,	Shelbyville, 1850, 57, 75, 79.
Logue, John, (M.I.)	Rural Hill, 1857.
Long, J. A.	Central Cross-roads.
McMinn, S. Newton,	Nashville, 1869. (d.)
McMurry, S. T., (M.I.)	Spring Hill, 1857.
McNutt, J. W.	Kingston, 1857.
McReynolds, W. T.	Clarksville, 1872, 75, 79.
Madden, Thomas L.	Nashville, 1857, 59.
Malone, H. B.	Gallatin, 1857.
Manlove, Jos. Edward,	Nashville, 1857, 67, 69, 70. (d. 1870.)
Martin, Robert,	Nashville, 1857. (d.)
Mayfield, Geo. A. J.	Nashville, 1857. (d.)
Mayfield, S. S.	Nashville, 1857. (d.)
Menees, Thomas,	Nashville, 1878, 79, 80.
Merrill, A. P., (M.)	Memphis, 1854. (d.)
Miller, W. J.	Fayetteville, 1880.
Millington, John,	Memphis, 1855, 57. (d.)
Mitchell, R. W.	Memphis, 1879.
Moore, W. P.	Mitchelville, 1857.
Morton, John H.	Nashville, 1859. (d.)
Murfree, James B.	Murfreesboro, 1873.
Murrill, J. C., (M.I.)	1857.
Newman, Joseph C.	Nashville, 1858, 59, 60.
Nowlin, John B. W.	Nashville, 1879.
Owen, Richard,	Nashville, 1857.
Painter, Fred, (M.I.)	Chattanooga, 1875, 79.
Park, J. P.	Knoxville, 1879.
Park, John S.	Franklin, 1857.
Perkins, N. C.	Franklin, 1857.
Pinkston, Alex. Rufus,	Nashville, 1869.
Plunket, J. D.	Nashville, 1879.
Poynard, J. Smith,	1870.
Pulliam, J. J.	Lagrange, 1879.
Quintard, C. T.	Memphis, 1852.
Ramsey, Frank A.	Knoxville, 1849, 51, 54, 55, 57.
Ransom, M.	Murfreesboro, 1857.
Rice, F.	Memphis, 1859.
Robards, H. R.	Memphis, 1859, 60. (d.)
Roberts, Deering J.	Henderson, 1875, 77, 79.
Roberts, J. C.	Pulaski, 1875.
Robertson, Felix, (M.I.)	1857. (d.)
Rodgers, James,	Knoxville, 1857.
Senter, W. D.	Hannas, 1857.
Shanks, Louis,	Memphis, 1854.
Sims, P. D.	Chattanooga, 1872, 73, 79.
Smith, G. F., (M.I.)	Somerville, 1857.
Smith, Miles,	Chattanooga, 1857.
Stockard, W. P., (M.I.)	Mount Pleasant, 1857.
Stroud, F. B., (M.I.)	Gladeville, 1857.
Summers, T. O., Jr.,	Nashville, 1880.
Sumpter, Jos. A.	Pulaski, 1875.
Tadlock, A. B.	Knoxville, 1879.
Thomas, N. L.	Clarksville, 1850.
Thomson, Rezin,	Nashville, 1869. (d. 1871.)

Thornton, Gustavus B.	Memphis, 1877, 80.
Thurm, Earnest Wm.	Nashville, 1869.
Towler, Jos. M.	Columbia, 1876.
Townes, J. F., (M.I.)	Farmville, 1857.
Van Deman, J. H.	Chattanooga, 1874, 75, 78, 79.
Voorhies, A. V.	Memphis, 1879.
Warmuth, H. Jos.	Smyrna, 1879.
Watson, John M.	Nashville, 1857.
Weed, Jas. F.	Nashville, 1872.
Weldon, A. J.	Paris, 1877.
Wharton, S. L.	Nashville, 1857. (d.)
Wheeler, E. D.	Murfreesboro, 1859, 60.
Whitaker, H. M.	Clarksville, 1857.
White, J. S.	Memphis, 1859, 60, 68.
White, R. G. P.	Pulaski, 1857.
Winston, C. K.	Nashville, 1853, 57. (d.)
Winston, J. D.	Nashville, 1857. (d.)
Woodson, T. M.	Hannas, 1857.
Woodward, P. S.	Nashville, 1857. (d.)
Wright, Daniel F.	Clarksville, 1859, 69.
Wright, E. M., (M.)	1873.
*Yandell, L. P.	Nashville, 1850. (d. 1878.)

TEXAS.

Adair, James B.	Cedar Creek, 1879.
Allen, R. H.	Dallas, 1874.
Bailey, James S., (M.)	1878. (?)
Brown, H. W.	Waco, 1874 v.p., 79.
Calloway, J. M.	Galveston, 1875. (d. 1876.)
Carothers, A. E.	Austin, 1877.
Christian, Geo. W.	Smyrna, 1880.
Dowell, Greensville,	Galveston, 1866, 69, 72, 76, 79, 80.
*Easley, E. T.	Dallas, 1874, 75. (d. 1878.)
Fort, J. M.	Paris, 1875.
Grizzard, L. A.	Sherman, 1880.
Haynie, S. G.	Austin, 1875.
Heard, Thomas Jefferson,	Galveston, 1867, 69, 70 v.p., 72, 74.
Irion, J. L.	Montgomery, 1870.
Kelley, Wm. Dennis,	Galveston, 1869.
Larendon, J.	Houston, 1875.
Leake, Henry K.	Dallas, 1880.
Locke, L. E.	Dallas, 1876.
McGregor, George C.	Wesley, 1869, 70, 75.
McLaughlin, James W.	Austin, 1874.
Matchett, J. F.	Waco, 1869, 73.
*Morrison, J. M.	Hearne, 1874. (d.)
Norris, James Thomas,	Brenham, 1869.
Nott, T. H., (M.I.)	Galveston, 1880.
Park, W. H.	Tyler, 1875.
Pope, John H.	Marshall, 1880.
Rush, E. W.	Paris, 1880.
Sanders, W. E.	Sherman, 1875.
Stalnaker, J. W.	Austin, 1875.
Tayler, M. A.	Austin, 1874.
Wallace, D. R.	Waco, 1873, 80.
Welch, Samuel M.	Galveston, 1869.
Willis, J. B.	Waco, 1879.
Willis, J. M.	Waco, 1870, 75.
Willis, Jos. S.	Waco, 1880.

VERMONT.

Adgate, Luther W.	Irasburg, 1865.
Allen, Charles L.	Rutland, 1853, 56, 60. 65, 80.
*Allen, Jonathan A.	Middlebury, 1846. (d. 1848.)
Anderson, ——,	1846.
Babcock, M. N.	Fairfield, 1849, 53.
Bancroft, Jesse P.	St. Johnsbury, 1849.
Bass, Zacheus,	Middlebury, 1849, 60, 65.
Belknap, Simon,	Rochester, 1865.
Benton, Wm. C.	1849.
Bingham, Le Roy M.	Burlington, 1880.
Blanchard, D. W.	Coventry, 1865.
Braley, Norman W.	Chelsea, 1865.
Brewer, F. B.	1849
Briggs, Geo. C.	Franklin, 1865.
Brigham, Chas. W.	Pittsfield, 1865.
Brown, Henry B., (M.I.)	Hartford, 1849, 55, 56.
Brown, Hiram S.	St. Johnsbury, 1865.
Bullard, Gales B.	St. Johnsbury, 1865.
Burnham, Z. P.	Montpelier, 1849.
Butler, L. C.	Essex, 1876.
Cahoon, Chas. S.	Lyndon, 1865.
Campbell, Daniel,	Saxtons River, 1860.
Campbell, E. R.	Bellows Fall, 1880.
Carpenter, Walter,	Burlington, 1849.
Carr, E. S.	Castleton, 1848, 53.
Chandler, Charles B.	Montpelier, 1849, 65.
Chandler, C. M.	Montpelier, 1880.
Chapman, William A.	Ludlow, 1860, 65.
Clark, Alonzo,	Woodstock, 1847.
Clark, Charles,	Montpelier, 1855.
Clark, Ripley,	Windsor, 1865.
Cleveland, Charles H.	Castleton, 1853.
Conant, David S.	Burlington, 1860.
Converse, Shubael,	Norwich.
Cook, Simeon A.	1846.
*Cushman, Earl,	Orwell, 1848, 53. (d.)
Cushman, T. T.	Lennenbury, 1865. (d.)
Dana, A. G.	Brandon, 1846, 49.
Davenport, Geo. S.	E. Randolph, 1880.
Downes, Charles S.	Topsham, 1864, 65, 68.
Drew, O. W.	Waterbury, 1849.
Eddy, M. H.	Middlebury, 1877.
Elliott, Geo. T., Jr.,	1855.
Emmons, Lewis,	Hartland, 1863, 64, 65.
Fassett, Oscar F.	St. Albans, 1864, 65, 80.
Ford, Corydon L.	1849, 53.
Goodwillie, Thos., (M.I.)	Rutland, 1880.
*Green, Horace,	1846, 47. (d. 1866.)
*Hall, Charles,	Burlington. (d. 1847.)
Harding, Abraham,	South Hero, 1865.
Harrington, Z. G.	Chester, 1865.
Hatch, Horace,	Burlington, 1848.
Hazen, Edward,	Woodstock, 1865.
Higginson, Francis J.	Brattleboro, 1849.
Hinckley, Israel,	Thetford, 1855.
Holton, Henry D.	Putney, 1864, 65, 66, 71, 76, 80.
Huntington, Wm. M.	Rochester, 1863, 65.
Hutchinson, Wm. R.	Enosburg Falls, 1877.

James, Henry,	Waterbury, 1860, 65, 71, 80.
Jameson, Egbert,	1846.
Jewett, Calvin,	St. Johnsbury, 1849, 50.
Ketchum, Benj. F.	St. Johnsbury, 1864.
Knight, E. A.	Springfield, 1864. (d. 1872.)
Knowles, Nathan H.	Bristol, 1860. 64.
McCollom, William,	Woodstock, 1864, 65, 66.
Markoe, T. M.	Castleton, 1847.
Miller, W. H.	1849.
Moody, W. B.	Brownington, 1865.
Moore, E. M.	Woodstock, 1849.
Morse, James R.	1849.
Newell, Selim,	St. Johnsbury, 1849, 53. (d. 1871.)
Nichols, Samuel,	Bellows Falls, 1865.
Niles, H. H.	Post Mills, 1849, 56, 65.
Paine, Ezra,	Montpelier, 1865.
*Palmer, B. R.	Woodstock, 1849. (d. 1866.)
Peck, C. W.	Brandon, 1880.
*Perkins, Joseph,	Castleton, 1846, 49, 55. (d. 1872.)
Pines, P.	Queechy, 1858.
Pitkin, A. S.	Burlington, 1849. (d.)
Putnam, Sumner,	Montpelier, 1868.
Ranney, W. R.	Townsend, 1848. (d.)
Richmond, Jas. S.	Woodstock, 1865.
Rockwell, Wm. H.	Brattleboro, 1849.
Rublee, Chauncy,	Montpelier, 1865. (d. 1870.)
Sanborn, E. K.	Rutland, 1860. (d. 1862.)
Sawyer, Longdon,	Springfield, 1865.
*Simons, Lewis E.	Saxons River, 1864. (d. 1865.)
Skinner, Jonathan F.	Barton, 1865.
Smith, Arrin,	1849.
*Spaulding, James,	Montpelier, 1846, 49. (d. 1858.)
Spaulding, Reuben,	1849.
*Stiles, Joseph N.	Windsor, 1849, 60, 63, 64, 65, 67. (d. 1875.)
Story, D. R.	West Windsor, 1865.
Story, Dyer,	Proctorsville, 1849.
Summers, Lewis E.	Saxtons River, 1865.
Thayer, S. W.	Burlington, 1849, 66.
Thayer, S. W., Jr.,	Burlington, 1858.
Upham, E. F.	West Randolph, 1865.
Wakefield, Thomas,	Fair Haven, 1880.
Warner, Erasmus D.	1859. (d.)
Washburn, Cyrus,	Vernon, 1849. (d. 1860.)
Watkins, E. V.	Newburg, 1865.
Whiting, Laurind G.	Chester, 1860.
Woodward, Adrian T.	Brandon, 1853, 60, 65, 77, 80.
Worcester, E. C.	Thetford, 1849.

VIRGINIA.

Alexander, J. A.	Broadway Depot, 1873.
Allen, B. W.	University of Va., 1855.
Anderson, J. B., (M.)	Louisa Co., 1852.
Archer, Carthon, (M.)	Richmond, 1852.
Ashby, C. W.	Culpepper Court House, 1852.
Ashby, O. H., (O.)	Culpepper Court House, 1859.
*Atkinson, Thomas P.	Danville, 1852, 53, 58. (d. 1874.)
Barr, S. B. F. C., (O.)	Big Spring Taylerville, 1852.
Barr, Wm. F.	Abingdon, 1870, 76.

Bates, W. G.	Wheeling, 1848.
Beales, James, (M.)	Richmond, 1852.
Becke, M. D., (M.)	1852.
Belt, H. Singleton,	Pittsylvania, 1852.
Blackford, Benj.	Lynchburg, 1870.
*Bohannon, R. L., (M.)	Richmond, 1852. (d.)
*Bolton, James,	Richmond, 1852, 53, 58. (d.)
*Boyl, Cornelius, (M.I.)	Fayon White Sulphur Springs, 1868. (d. 1878.)
Broocks, John N.	Richmond, 1847, 52. (d.)
Brown, J. Conway,	Alexandria, 1858.
Brown, O. A.	Hicksford, 1852. (d. 1855.)
Brown, P. F., (M.I.)	Appomattox Court House, 1855.
Burruss, J. L., (M.I.)	Louisa Court House, 1850, 52.
Cabell, J. G.	Richmond, 1855.
Cabell, J. L.	University of Va., 1847, 55, 77, 78, 79, 80.
Cabell, R. H., (M.)	Richmond, 1852. (d.)
Cabell, R. G., (M.)	Richmond, 1852.
Carmichael, Geo. F.	Fredericksburg, 1847, 48, 52.
Chancellor, J. Edgar,	Charlottesville, 1875, 79, 80.
*Christian, M. P.	Lynchburg, 1868, 72. (d.)
Claiborn, J. H., (M.)	Petersburg, 1852.
Coakley, J. B.	Richmond, 1872.
Cochran, William B.	Middleburg, 1849, 55.
Coleman, John C.	Richmond, 1852.
Conway, H. James,	Richmond, 1846, 60. (d.)
Cooke, A. T. M.	Norfolk, 1849. (d.)
Corbin, G. Lane,	Halfway House, York Co., 1847, 48, 49, 50, 52. (d.)
Cox, Thomas E.	Richmond, 1852.
Craghead, W. G.	Danville, 1852.
Creigh, Thomas, (M.)	Lewisburg, 1852. (d.)
*Cullen, John,	Richmond, 1846. (d. 1850.)
Cullen, J. S. Dorsey,	Richmond, 1876.
Cunningham, Francis D.	Richmond, 1872, 77, 80.
Cunningham, John A.	Richmond, 1852.
Cunningham, J. D., (M.I.)	1870.
Dabney, W. C.	Charlottesville, 1875.
Dandridge, A. S., (M.)	1850.
Davis, John Staige, (M.)	University of Va., 1852.
*Deane, F. H., (M.)	Richmond, 1852. (d. 1870.)
Dillon, A. S.	Farmville, 1855.
Dorset, J. Lewis,	Geneto, 1855.
Dove, James,	Richmond, 1852. (d.)
Dove, John,	Richmond, 1852, 53.
Edwards, Landon B.	Richmond, 1879.
Faunt, Le Roy John,	White Post, 1849, 52, 58.
Fox, W. H., (M.I.)	1852.
Frissell, John,	Wheeling, 1850.
George, A. S.	Richmond, 1880.
Gibson, Charles Bell,	Richmond, 1852, 55. (d. 1865.)
Gilbert, R. H.	Fortress Monroe, 1863.
Gleaves, Samuel C.	Wytheville, 1879.
Gooch, P. Claiborne,	Richmond, 1851, 52, 53, 55. (d.)
Goodloe, Theodore, (M.)	1853.
Griffith, Michael J., (M.I.)	Fredericksburg, 1870.
Gwathmay, ——, (M.I.)	1852.
Hancock, F. W.	Richmond, 1852. (d. 1865.)
Harrison, E. J.	Cartersville, 1852.
Haskins, Wm. D.	Richmond, 1852.

*Haxall, Robert W.	Richmond, 1846, 47, 52, 70. (d. 1872.)
Hildreth, E. A., (M.I.)	Wheeling, 1850, 58.
Hooper, W. D.	Liberty, 1880.
Horner, Frederick, Jr.,	Salem, 1870, 72, 73.
Houston, Matthew H.	Wheeling, 1847. (d.)
*Howard, Henry,	University of Va., 1848. (d. 1874.)
Hupp, J. C., (M.I.)	Wheeling, 1858. 63.
Hurt, J. M.	Nottoway Co., 1852, 55.
Johnson, Carter P.	Richmond, 1847, 51, 53.
Johnson, James,	Hicksford, 1852.
Johnston, Geo. Benj.	Richmond, 1880.
Joynes, L. S.	Richmond, 1852, 58, 59, 70, 72, 76.
Kimper, Charles R.	Woodville, 1853.
Lake, R. Pinckney,	Richmond, 1852.
Langhorn, D. A.	Lynchburg, 1852, 70, 76.
Latham, Henry,	Lynchburg, 1870.
Lee, George,	Leesburg, 1852.
Leigh, H. G.	Petersburg, 1858.
Lewis, M. M.	Alexandria, 1858.
Lewis, Zachary, (M.)	Cumberland Co., 1852.
Lewis, R. A.	Richmond, 1852.
Linton, John F.	1853.
Little, John P.	Richmond, 1852. (d.)
Lumpkin, J. G.	Hanover, 1851.
Lyle, James,	Farmville, 1855.
McCaw, James B.	Richmond, 1852, 58, 60, 70, 72, 80.
*McGuire, Hugh Holmes,	Winchester, 1847, 48, 49 V.P., 50, 51, 52, 55, 58. (d.)
McGure, Hunter,	Richmond, 1872, 80.
McIlhenny, S. W.	Wheeling, 1848. (d.)
Magill, H. D.	Leesburg, 1848.
Marx, Frederick,	Richmond, 1846.
Mason, A. H.	Falmouth, 1852.
Massi, Hardin,	Charlottesville, 1847. (d.)
Massie, J. McD.	Richmond, 1879.
*Maupin, Socrates, (M.)	1852. (d. 1871.)
Meriwether, Wm. D., (M.)	Richmond, 1852.
Merritt, A. T. B.	Richmond, 1852.
Mettauer, John P.	Prince Edward, 1852. (d.)
Miller, John T., (M.)	1852.
Mills, Charles S.	Richmond, 1846, 52.
Minor, Hubbard Taylor,	Fredericksburg, 1873.
Moore, Wm J.	Norfolk, 1853.
Morrison, E. A.	Lawrenceville, 1852.
Mosley, W. P.	Buckingham, 1852.
Nash, Herbert M.	Norfolk, 1879, 80.
Nash, John W., (M.)	1852.
Nicholson, George L.	Middlesex, 1852.
Otis, George A.	Richmond, 1852, 53.
Owen, W. O.	Lynchburg, 1868.
Palmer, C. R., (M.)	Cumberland Co., 1852, 53.
Parker, Wm. W.	Richmond, 1851, 52, 53, 58.
Patrick, Spicer,	Kanawha C. H., 1850, 52.
Patterson, Samuel A.	Manchester, 1846, 52. (d)
Patterson, Wm. A.	Richmond, 1852.
Payne, Albert S.	Paris, 1852, 53, 58, 59, 79.
Peachy, B. St. George, (M.)	Richmond, 1852. (d.)
Peebles, J. F.	Petersburg, 1847, 48, 53, 55. (d. 1858.)
*Peticolas, A. E	Richmond, 1852. (d. 1868.)
Philips, W. H., (M.I.)	Sublett's Tavern, Powhatan Co., 1857.
Pollard, Thomas,	Richmond, 1858.

Powell, H Brooke,	Alexandria, 1852.
Powell, F. W.	Middleburg, 1851.
Power, R. H.	Yorktown, 1852.
Quarles, Charles,	Mechanicsville, 1852.
Randolph, Robert C.	Millwood, 1848, 52.
Riddell, T. J.	Richmond, 1876.
Rives, N. F., (M.)	1852.
Robinson, Thomas, (M.)	Cumberland Co., 1852. (d.)
Roddey, F. W.	Richmond, 1852, 53. (d. 1865.)
Rogers, Robert E.	University of Va., 1852.
Ross, Geo.	Richmond, 1880.
Schoolfield, I. N.	Petersburg, 1858.
Scott, Martin P.	Richmond, 1851, 52.
Scott, T. L., (M.I.)	1852.
Selden, Henry,	Norfolk, 1848, 52. (d.)
Selden, William,	Norfolk, 1847.
Silvester, R. W.	Norfolk, 1849. (d.)
Skelton, John G.	Richmond, 1852, 72.
Smith, Joseph W.	Petersburg, 1855. (d.)
*Snead, Albert,	Richmond, 1852. (d. 1873.)
Somerville, Walter, (M.I.)	Culpepper, 1870.
Southall, Philip F., (M.)	1852.
Spencer, Pitman C.	Petersburg, 1852, 55, 58, 59. (d. 1860.)
Spilter, Adam,	Buchanan, 1854.
Stewart, W. D., (M.I.)	1866.
Tabb, J. Prosser,	Gloucester, 1851, 52.
Tanner, James,	Wheeling, 1850.
Tatum, R. H.	Chesterfield Co., 1852.
Taylor, R. K.	Columbia, 1852.
Taylor, Wm. H.	Richmond, 1858.
Taylor, Wm. T.	1852.
Terrill, George F.	Caroline Co., 1852.
Thweatt, J. J.	Petersburg, 1852. (d. 1868.)
Tipton, Joseph S.	Hillsville, 1875, 76, 79.
Trent, Peterfield,	Richmond, 1853, 55.
Trent, W. R.	Richmond, 1850, 52.
Trigg, Daniel,	Abingdon, 1847. (d.)
Tucker, Alfred B.	Winchester, 1855.
*Tucker, David H.	Richmond, 1851, 52. (d. 1871.)
Upsher, Geo. L.	Norfolk, 1848. (d.)
Walke, J. Wister,	Chesterfield, 1851, 52, 53.
Walker, M. M.	Richmond, 1872.
Walshe, Samuel, (O.)	Prince George Co., 1852.
Warr, Thomas B.	Norfolk, 1880.
Watson, ——, (M.I.)	1852.
*Wellford, Beverly R.	Richmond, 1847, 48, 51 V.P., 52 P., 53, 55. (d. 1870.)
Wellford, J. Spottswood,	Richmond, 1852, 70, 72, 76.
West, Geo. W.	Richmond, 1870.
White, I. H., (M.)	Richmond, 1872.
White, Luke,	Petersburg, 1852.
Wiley, John B.	Matoax, Amelia Co., 1858.
Williman, A. B., (O.)	Norfolk, 1857.
Wilson, G. A.	Richmond, 1852.
Wilson, W. E.	Richmond, 1852. (d.)
*Withers, Thomas,	Petersburg, 1860.
Worsham, H. C.	Dinnwiddie, 1851. (d.)
Wortham, A. G.	Richmond, 1852. (d.)
Yerby, G. T.	Eastville, 1852. (d. 1865.)

WEST VIRGINIA.

Baird, George,	Wheeling, 1870, 73.
Bates, William Jourdan,	Wheeling, 1869.
Bates, W. J., Jr.,	Wheeling, 1872.
Berkebile, J. K.	Fairmont, 1870, 73.
Bland, Wm. J.	Weston, 1872, 75.
Blum, Richard,	Helvetia, 1877.
Brock, Hugh W.	Morganstown, 1870, 72, 78.
Brownfield, J. H.	Fairmont, 1873.
Campbell, M.	Parkersburg, 1867, 70, 80.
Cooper, John M.	Wellsburg, 1870.
*Cummins, James,	Wheeling, 1870, 74. (d. 1877.)
*Cummins, Robert H.	Wheeling, 1868, 71, 72. (d. 1873.)
Davis, Rezin P.	Parkersburg, 1867. (d. 1877.)
Dent, W. M.	Newburg, 1870.
Edwards, T. O.	Wheeling, 1880.
Ford, Sample,	Wheeling, 1875, 80.
Frissell, John,	Wheeling, 1867, 69, 70, 71, 74, 75, 77, 78, 80.
Hall, M. S.	Harrisville, 1876.
Hazlett, Robert W.	Wheeling, 1870, 74.
Hildreth, E. A.	Wheeling, 1867, 68, 71, 72, 75, 77, 78.
Hunt, L. C.	Parkersburg, 1878, 80.
Hupp, John C.	Wheeling, 1867, 69, 74, 75, 76, 77, 78.
Kendall, J. E.	Wirt, 1872, 75, 76.
Lazzell, James M.	Fairmont, 1868, 70, 72, 78, 80.
Miller, J. P.	Buchanan, 1880.
*Moore, Eli Hardman,	Wellsburg, 1871. (d. 1878.)
Ramsay, J. W.	Clarksburg, 1867, 70, 75, 80.
Reeves, James E., (M.I.)	Wheeling, 1866, 80.
Rupert, C. A.	Big Clear Creek, 1875.
Thayer, A. H.	Grafton, 1870.
Todd, A. S.	Wheeling, 1870.
Vankirk, W. F.	Grafton, 1880.
Wall, J. Owen,	Huntingdon, 1878.
*Wiesel, H. J.	Wheeling, 1870. (d. 1873.)

WISCONSIN.

Adams, Homer,	Janesville, 1860, 63, 64.
Alexander, Charles,	Eau Claire, 1877.
*Ames, A. E., (M.)	Rock River, 1848. (d. 1874.)
Armstrong, L. G.	Boscobel, 1876.
Ayres, D. Cooper,	Green Bay, 1856, 58.
Barnett, J. R.	Neenah, 1877.
Bartlett, John Knowlton,	Milwaukee, 1854, 55, 57, 64, 66, 69, 70, 71, 72 v.p., 73, 74, 75, 76, 77, 78, 79, 80.
Bell, Samuel,	Beloit, 1880.
Benton, Joseph L., (M.)	Beloit, 1872.
Bicknell, G. W., (E.P.M.)	Beloit, 1863. (d.)
Bond, D. M.	Johnstown, 1874, 76, 77.
Boughton, D. F., (M.I.)	Mendota, 1877, 79.
Brisbane, Wm. H.	Arena, 1856 v.p.
Brown, Joseph J.	Madison, 1855, 79.
Burrall, Geo. W.	Dodgeville, 1877.
Butterfield, H. L.	Waupun, 1874, 77.
Carr, E. S.	Madison, 1863 v.p.

Castleman, Alfred L.	Delafield, 1855. (d.)
Catlin, G. E.	Geneva, 1880.
Chapman, C. B.	Madison, 1853, 56, 59.
*Dalton, Nicholas,	Mineral Point, 1867. (d. 1875.)
Davis, Moses M.	Baraboo, 1877.
Day, Dwight W.	Eau Claire.
De Hart, I. N.	Mendota, 1878, 80.
Dodson, N. M.	Berlin, 1872, 73.
Dorland, James,	Milwaukee, 1877.
*Dousman, John B.	Milwaukee, 1854, 55, 56, 60. (d. 1868.)
Eastman, Wm.	Mineral Point, 1877.
Floyd, R. G., (M I.)	White Hall, 1877.
Fox, G. H.	Oregon, 1880.
Fox, Philip,	Madison, 1877.
Fox, William,	Madison, 1876, 77.
Freeman, A. R.	New London, 1880.
Godfrey, H. T., (M.I.)	Benton, 1877.
Graettinger, Alois,	Milwaukee, 1876, 77.
Griffin, E. L.	Fond du Lac, 1874, 77, 79.
Hausman, Wm.	Ashford, 1878.
Hopkins, John F.	Oconomowoc, 1878.
Hoy, Philo Romayne,	Racine, 1870, 72.
Hunt, Geo. F.	North Bend, 1873, 77.
Jenkins, Geo. W.	Kilburn City, 1879, 80.
Kempster, Walter,	Oshkosh, 1877, 78, 80.
La Count, David,	Chilton, 1873, 74, 75, 77.
Linde, Christian,	Oshkosh, 1872, 74.
Linde, F. H.	Oshkosh, 1873, 77.
Lueck, A. W.	Mayville, 1877. (d.)
McKinley, Hays,	Kenosha, 1856, 57.
Marks, Solon,	Milwaukee, 1877, 79.
Mason, Darius,	Milwaukee, 1871, 76, 77.
Meachem, John G.	Racine, 1863, 67, 74, 77.
Meacher, Wm.	Portage City, 1877.
Moffitt, James B.	Mineral Point, 1867, 77.
Moffit, J. R., (M.I.)	Prairie du Chien, 1877.
O'Brien, J. N., (E.P.M.)	Plymouth, 1877.
Palmer, H.	Janesville, 1876.
Parker, John, (M.I.)	1850.
Pease, Clark G.	Janesville, 1855, 56. (d.)
Reeve, James T.	Appleton, 1872, 77, 79.
Rogers, E. M.	Hartford, 1876, 77.
Rogers, J., (M I.)	Ripon, 1877.
Russell, Thomas P., Jr.,	Oshkosh, 1873, 74, 75, 77, 78, 80.
Senn, Nicholas,	Milwaukee, 1873, 77, 78.
Steele, Geo. M.	Oshkosh, 1877.
Stoddard, Charles L.	La Crosse, 1863, 77.
Strong, H. P.	Beloit, 1873, 75, 76.
Taggart, C. J., (M.I.)	Beloit, 1863. (d.)
Thomas, Wm. M.	Darlington, 1866, 77. (d.)
Thorn, S. S.	Milwaukee, 1856.
Treat, R. B., (M.I.)	Janesville, 1863.
Van Dusen, W. H.	Montfort, 1877.
Van Dusen, Harmon,	Mineral Point, 1853, 63, 64, 66, 67, 69, 74.
Ward, A. J.	Madison, 1876.
*Waterhouse, M.	Portage City, 1874. (d.)
Wells, Wm. L.	Milwaukee, 1860.
Whiting, J. B.	Janesville, 1874.
Wight, O. W.	Milwaukee, 1879, 80.
Wilber, George D.	Mineral Point, 1854, 63, 77.

Witter, G. F.	Grand Rapids, 1873.
Wolcott, E. B.	Milwaukee, 1878.
Zielly, H. E.	Chelton, 1876.

U. S. TERRITORIES.

Bond, Thomas, (M.I.)	Indian Territory, 1868.
Cooper, Jas. G., (M.I.)	Washington Territory, 1853.
Goodenough, Alonza, (E.P.M.)	Idaho, 1873.
Graham, John W., (M.I.)	Utah-Cerin, 1871.
Jayne, Wm., (E.P.M.)	Dacota Territory, 1863.
Ross, R. D.	Cherokee Nation, 1854.

AMERICAN MEDICAL SOCIETY OF PARIS.

Atlee, Walter F.	Philadelphia, 1855.
Berry, Wm. H.	Washington, 1852.
Hagner, Daniel R.	Washington, 1858.
McIlvaine, Robert R.	New York, 1853.
Pittman, N. J.	Tarboro, N. C., 1853.
Simmes, Alex. J.	Macon, Ga., 1852.

U. S. ARMY.

Alden, C. H.	New York, 1880.
Antisell, Thomas, (S.V.)	Washington, 1864, 65.
Billings, John Shaw,	Washington, 1868, 69, 70, 74, 75, 76, 77, 78, 79, 80.
Brown, J. B.	New York, 1880.
Clements, Bennett A.	1869, 73.
Coolidge, Richard H.	Washington, 1853. (d. 1866.)
Craig, B. Fanueil,	Washington, 1868, 70, 72. (d. 1877.)
Curtis, Edward,	Washington, 1868.
Cuyler, John M.	1853.
Darby, George, (S.V.)	1865. (d. 1874.)
*Finley, Clement A.	1854. (d. 1879.)
Fletcher, Robert, (S.V.)	Washington, 1867.
Forwood, William H.	Atlanta, Ga., 1879.
Fryer, Blencome E.	Ft. Leavenworth, Ks., 1878.
Greenleaf, Charles R.	1867.
Gross, Ferdinand H., (S.V.)	Philadelphia, 1865.
Janeway, John H., (M.I.)	1880.
Jarvis, Nathan S.	1858. (d. 1862.)
King, Benjamin,	West River, Md., 1847.
Lyman, George H.	1865.
*McLaren, Adam N.	1854. (d. 1874.)
McParlan, T. A , (M.I.)	1880.
Magruder, David L.	1873, 77.
Moore, John,	1874.
Mower, T. G., (M.I.)	1853.
Murray, Robert,	1853.
O'Reilly, Robert M.	Atlanta, Ga., 1879.
Otis, George A.	Washington, 1865, 68, 70.
*Peters, De Witt C.	1866. (d. 1876.)
*Porter, John B.	1851, 63. (d. 1869.)
Sargent, B. Webster, (E.P.M.)	1865.
*Simpson, Josiah,	1853, 63, 66. (d. 1874.)
Smith, Joseph R.	1874, 75, 76, 77 v.p., 78.

Spencer, Wm. C.	1877.
Taylor, M. K.	1871.
Thomson, Wm.	1867.
Tremaine, William S., (E.P.M.)	1878.
Tripler, Charles S.	1850, 56, 59 v.p., 64, 65. (d. 1866.)
White, C. B., (M.I.)	1880.
*Wirtz, Horace R.	1864. (d. 1874.)
Wood, Robert C.	1858. (d. 1869.)
Woodward, Joseph J.	Washington, 1865, 66, 67, 68, 69, 70, 72, 73, 74, 75 v.p., 76, 77, 78, 79.

U. S. NAVY.

Bache, Benjamin F.	1853, 60, 64.
*Barrington, Samuel,	1855. (d. 1862.)
Beale, Joseph,	1865, 72.
Bloodgood, Delevan,	New York, 1880.
Brown, John M.	1871.
Brownlee, James, (M.I.)	1853.
Cleborne, C. J.	1876.
Clymer, George,	Washington, 1858, 68, 70, 72.
Cones, E. F.	Brooklyn, N. Y., 1880.
Dean, Richard C.	Washington, 1872.
Delaney, M. G.	1849. (d. 1866.)
Dillard, T.	1855. (d. 1870.)
Duvall, Marius,	1878.
Eversfield, Charles,	1864, 68, 73. (d. 1873.)
Flint, James M.	1878.
Foltz, Jonathan M., (M.I.)	1848. (d. 1877.)
*Green, James M.	Philadelphia, 1855. (d. 1871.)
Gunnell, F. M.	Washington, 1849, 76.
Gihon, Albert L.	1876, 79, 80.
Gorgas, A. C.	1875.
Harlan, David,	1866.
Henderson, A. A.	1870, 74. (d. 1875.)
Hord, Wm. T.	Boston, 1877.
Horner, G. R. B.	1855.
Jackson, S.	1865.
Kindleberger, D.	1871.
Lansdale, Philip,	1871.
Leach, Thomas W.	1878.
Lockwood, John A.	1848.
Macconn, Robert T.	1873, 74.
Maxwell, Charles D.	Washington, 1858, 68.
Neilson, John L.	1875.
Penrose, Thomas N.	1875.
*Pinkney, Ninian,	1848, 52, 53, 54, 66, 67, 69, 70, 71, 75, 76 v.p. (d. 1877.)
Potter, Frederick E.	1869.
Ruschenberger, W. S. W.	Philadelphia, 1870.
Shippen, Edward,	1864, 74.
Smith, D. G. (?), (E.P.M.)	1865.
Smith, Thomas L.	1864, 65.
Spear, John C.	1872.
Taylor, J. Winthrop,	1865, 77. (d. 1880.)
Taylor, W. E.	1871.
Tryon, J. R.	Washington, D. C., 1880.
Turner, Thomas J.	1879.
Wales, Philip S.	Washington, 1870.

Whelen, Wm., (?) Washington, 1864 v.p., 65 v.p.
Wilson, Joseph, 1875, 76.
Wood, Wm. Maxwell, 1848, 66, 68. (d. 1880.)
Woodworth, Robert, 1867. (d. 1870.)

FOREIGNERS.

These physicians were made members by invitation.

Alt, A. Canada, 1878.
Andrews, Alfred A. Windsor, Canada, 1874.
Axtelle, J. L. Liverpool, England, 1880.
Bayard, W. St. John's, N. B., 1865.
Bell F. F. Amherstburg, Canada, 1874.
Berryman, John, New Brunswick, 1872.
Bethune, N. Toronto, Canada, 1856.
Beylard, ——, Paris, France, 1852.
Botsford, Le Baron, Canada, 1875, 78.
Brigham, J. S. Montreal, Canada, 1865.
Bucke, R. M. Canada, 1877.
Caniff, Wm. Toronto, Canada, 1874.
Carney, R. Windsor, Canada, 1874.
Case, J. A. Canada, 1878.
Casgrain, Charles E. Windsor, Canada, 1874.
Clark, David, Toronto, Canada, 1878, 80.
Clark, T. Canada, 1878.
Coatsworth, G. Kingsville, Canada, 1856.
David, A. H. Montreal, Canada, 1880.
De Mola, Emile L. Lima, Peru, 1880.
De Wolf, Jos. P. Halifax, 1865.
Dewsen, A. K. Windsor, Canada, 1856.
Dillon, ——, Dublin, Ireland, 1880.
Dixon, M. L. Montreal, 1880.
Drysdale, ——, London, 1880.
Ercolani, G. B. Bologna, Italy, 1880.
Foster, Stephen, Quebec, 1865.
Gamgee, John, England, 1868.
Gaston, Campanos I. McFaden, Brazil, 1880.
Gordon, J. McKenzie, Australia, 1880.
Graham, J. E. Toronto, Canada, 1878.
Grant, J. A. Ottawa, Canada, 1874, 77.
Hall, C. B. Toronto, Canada, 1874.
Hall, Marshall, London, 1853.
Haswell, W. Toronto, 1856.
Hingston, W. H. Montreal, 1877, 80.
Hiorth, W. Norway, 1876.
Hodder, Edward M. Toronto, 1853, 56.
Holst, H. C. Norway, 1876.
Howard, ——, Montreal, 1880.
Hutchinson, Jonathan, London, 1880.
Hutchinson, Joseph, Liverpool, 1880.
Kalley, Robert Reed, Beyroot, 1853.
Lambert, Walter, Windsor, Canada, 1874.
Lange, F. Keil, Germany.
McCay, ——, Caledonia, Canada, 1878.
McClean, T. F. Kingston, Canada. 1874.
McCormack, F. B. Ripon, Canada, 1874.
McIlvaine, Robert R. Paris, France, 1853.
McLean, Thomas, Canada, 1878.
McMicking, Geo. M. Goodrich, Canada, 1874.

Mack, T.	St. Catharines, 1878.
Marsden, William,	Quebec, 1865, 66, 67, 68.
Moe, L. V.	Ottawa, Canada, 1874.
Moore, Charles E.	London, Canada, 1874.
Murphy, Bray,	Chatham, Canada, 1874, 78.
Nesbitt, E.	Sandwich, Canada, 1874.
Osller, ——,	Montreal, 1880.
Parker, Peter,	China, 1866.
Richardson, J. H.	Toronto, 1856, 74.
Rose, Fred. H.	British Army, 1858.
Rosebrugh, J. W.	Hamilton, Canada, 1878, 80.
Ryerson, G. S.	Toronto, 1880.
Scott, S. A.	Woodstock, Canada, 1856.
Scott, William,	Woodstock, Canada, 1874.
Séquard, E. Brown,	Paris, France, 1852.
Steaves, ——,	Canada, 1875.
Stevenson, John A.	London, Canada, 1880.
Tarquand, John,	Canada, 1856.
Trenholme, E. H.	Montreal, 1878, 80.
Trenholme, Jos.	Montreal, 1880.
Van Patten, C. H.	Central America, 1871.
Watters, ——,	Canada, 1878.